

Customers' Satisfaction of Municipal Water Supply in Jos-Metropolis, Plateau State Nigeria

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ABSTRACT

Customer satisfaction may be summed up as the feeling of pleasure that customers have after using or engaging with a company's product or service. For water as product must be of good quality, sufficient quantity and fair pricing to customers to feel satisfied. This study examines customers' satisfaction of Municipal water supply in Jos-Metropolis of Plateau State, Nigeria. A mixed research method was applied on the unpredictable customers behaviour towards water supply from PWSC in 7 randomly selected districts of Yelwa, Rahol-Kanang, Nassarawa, Kufang, Federal Lowcost and Utan using purposive sampling and a structured questionnaire was administered on 372 respondents while interviews and FGD was also conducted to complement data collected. The data was analyzed using percentages and regression analysis of SPSS 23.0 application. The findings revealed customers' satisfaction is reliant on the distribution of sufficient quantity and good quality water for sustainable health. Despite a major affirmation to the quantity and quality of water supplied. Customers, yet attested to coloured, tasteful and particle filled the water supplied from PWSC and demonstrated non-satisfaction to the quality, quantity and price of water supply. This was supported by the regression analysis result showing insignificance on the variables tested at 0.05 significant levels. However, recommendations were made to model PWSC water distribution strategies to meet the global standard for efficient water distribution and among others.

Keywords: Customers' satisfaction, Jos-Metropolis, municipal, PWSC, water supply

INTRODUCTION

The Plateau State Government in 1991 established Plateau Water Service Corporation (PWSC) through Edit No. 4 and outlines functions of the Board. The Edict gives it the dual function of being a service provider and a regulator. The primary duty of the PWSC is to ensure that water is supplied to customers at reasonable charges and in potable quality and adequate quantity. Other duties include, to manage, control and extend waterworks vested in it by the law and to develop new ones. PWSC is empowered to enter into agreement to delegate any of its functions, services or facilities to any other body or institution. It is saddle with the responsibility to provide water to the Municipal Council as a municipal water system which provides potable water to a wide array of commercial property and domestic use including apartments, condominiums, duplex housing and single family dwellings. Conveying potable water from a water treatment facility to residential customers for use as drinking water, water for cooking, water for sanitary conditions, and other water uses in a home environment is the responsibility of municipal water delivery systems (Kim and Romanova, 2018). The availability of water is also necessary for business and industry to function in a municipal setting.

The requirement to supply water to fire hydrants that are strategically placed in order to effectively safeguard the public from fire is not less significant. Municipal water systems might also be required to supply water for extra services like street sweeping, selling water to builders for building projects, parks and recreation, and other unspecified uses. The two main needs for municipal water systems are either to reliably deliver an appropriate amount of water to meet consumer demands with fire flow or to be efficient (Shcherbakov. et al., 2013; AWSS, 2019 and Pomogaeva and Vasilyeva, 2020). For PSWC to serve its

customers, there must be a steady supply water to satisfy both general home water needs and other water needs (Hickey, 2008; Akimov and Simshauser, 2020). The demand for water supplies is rising as a result of population increase and urbanization. To accommodate the growing economic expansion of urban services like domestic water usage, healthcare facilities, schools at all levels of education, commercial enterprises, industrial complexes, and adjunct uses with a steady supply of water to meet consumption needs in the broadest sense as well as other water needs, the spatial coverage of water supply must also be increased. Regrettably, sources of water supply for optimal distribution has been experiencing gross inconsistent to volume of water availability, epileptic distribution of water and poor quality of water supply. Several efforts made by government, PSWC and private sectors to develop an efficient water supply system have been fruitless because of the complex nature of the water distributional system as well as the springing up new urban settlement within and outside the environment in Plateau state. Customers satisfaction is the key of any service provider and to measure customers' satisfaction, evaluation of the customers satisfaction must be the concerned. Customers are crucial in water business, understanding their behaviours, attitudes, and preferences lead to the knowledge of their satisfaction or dissatisfaction. Some empirical investigations that have demonstrated a connection between customer happiness and willingness to pay for water supplies lend credence to this argument (Sualihu, Rahman & Zakiya, 2017; Kayaga, Franceys & Sansom, 2004; Power, 2016). Plateau Water Service Corporation (PWSC) is under a lot of pressure to satisfy their customers. The significance of consumers is thus one of the most crucial components of water services. However, these become necessary carry out this study and find out the level of residents satisfaction of municipal water supply provided by PWSC.

LITERATURE REVIEW

Concept of Customer Satisfaction

Customer satisfaction may be summed up as the feeling of pleasure that customers have after using or engaging with a company's product or service. Oliver (1997) defined customer satisfaction as the response to and assessment of the fulfilled state by the consumer. The quest to comprehend customer satisfaction had resulted in the development of theories like the "disconfirmation of expectations theory of consumer satisfaction" and the "value-percept disparity model" According to the "disconfirmation of expectations" model, consumer responses to satisfaction or other factors are based on a cognitive evaluation process in which pre-purchase "expectations" or prior beliefs of product-related experiences or outcomes are recalled from memory and contrasted with cognitions about the product-related experiences or outcomes actually obtained in the consumption of the product (Westbrook & Reilly, 1983). The degree of consumer satisfaction and desire to pay are directly related on their overall satisfaction with the services provided as well as customers' willingness to pay for service enjoyed (Ohwo and Agusomo, 2018). It is crucial to comprehend customer satisfaction and readiness to pay for water supply in order to increase service quality in accordance with consumers' needs. The level of satisfaction or discontent felt is base on service provided (Tamjidymcholo and Hardaker, 2017). As a result, it's crucial to makes it possible to gauge consumer satisfaction by pointing out discrepancies between expectations and actual experiences (Hormann, 2016). Due to a number of factors, including inadequate budgetary allocations by the respective governments, outdated pipes that frequently break, inadequate infrastructure investment, unstable power supplies, unmotivated staff, subpar revenue collection, urbanization, corruption, and a highly politicized tariff setting regime, customer satisfaction with municipal water supply in developing countries remains a significant challenge (Gowela, Alleyne & Chinopfukutwa, 2017; Ohwo, 2016; Environmental Rights Action & Friends of the Earth, Nigeria, 2016; LWC, 2013).

Therefore, customer satisfaction may be summed up as the feeling of pleasure that have after using the resource for the following benefits:

Health benefits

Acute respiratory illnesses and newborn mortality have significantly decreased when people have enough access to good water facilities (Jefferson et al., 2009, Luby et al., 2005, Rhee et al., 2008). Improvements in water quality can stop the development of water-borne infections, according to Cairncross and Valdmanis (2006). It has been demonstrated that using techniques like hand washing, sanitation, water treatment, and safe drinking water storage can cut diarrhea rates by 30–40% (Curtis & Cairncross, 2003; Fewtrell et al., 2005; Clasen et al., 2007). Up to 80% of infections in many developing nations are related to inadequate water and sanitary facilities (UN, 2003). According to estimates from UN-HABITAT and the UNEP, half of all hospital beds worldwide are occupied by patients with diseases associated with contaminated water. Thus, need for efficient and effective water supply to municipal areas is emphasis for the health of the people.

Improved Wellbeing and Save Time

According to the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) report, women may experience low self-esteem and a sense of pessimism as a result of discomfort brought on by inadequate water and sanitation (GLAAS, 2014). Reduced time spent collecting water and attention to the health issues brought on by inadequate water supply, sanitation, and hygiene is to provide adequate water supply (Barbara, 2014). Girls may attend school more frequently and complete more of their education if they spend less time looking for water and travelling farther to defecate in the woods or other risky places. Water-related illnesses cause 443 million missed school days annually (UNDP, 2006). For women, children, the elderly, and those with disabilities, access to water facilities will result in fewer days missed at home, at school, or at work due to avoided illnesses, as well as greater comfort, privacy, and safety, all of which contribute to a greater sense of dignity and general wellbeing (WaterAid, 2014).

Quality and Quantity Benefits

The term “quality” relates to making sure that the drinking water is pure, free of toxins or other impurities, and that the water flows consistently from the faucet. A set of criteria for water that does not endanger human health and/or imposes limitations on how much water may be used is referred to as water quality (Magara, n.d). It is possible to evaluate the consistency of water using its chemical, physical, biological, and radiological properties (Diersing, 2009). The biological, physical, and chemical characteristics of the water are all influenced by the intended use of the water. Theoretically, drinking water might be free of harmful microorganisms and poisonous substances (Bos, Alves, Latorre, Macleod, Payen, Roaf, & Rouse, 2016). One of the most important problems facing the globe today, especially in Africa, is the contamination of water supplies (Amaliya, & Kumer, 2013).

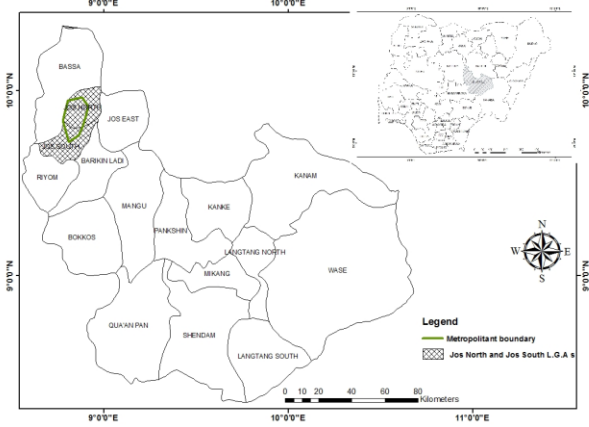
Water quantity is a fundamental need for everyone. One of the first steps in delivering that supply is figuring out how much is required. Since it could be challenging to provide everyone with enough water right away, water can be made available in stages (Innocent, et al., 2022). The need of sufficient water quantity for human health has long been acknowledged, and the relative significance of water quantity has been the subject of intense dispute (For a few unique situations, standards for water supply amounts have been recommended. For instance, the SPHERE project specifies that the minimal requirements for disaster relief must be met by using 15 litres of water per person per day (SPHERE, 1998). Water usage in a home might change for a variety of reasons. For instance, a home might use a newly installed standpipe inside the compound rather than a common standpipe. The average amount per person per day that the WHO recommends is between 100 and 200 litres (Moral 2020).

Consumers Satisfaction and Preference

According to Kefyalew, (2018), the extent to which a consumer is satisfied with a good or service is therefore determined by the perceived performance of the utility which is an evaluation of that good or service in the light of consumers needs. If the utilities know what customers regard as important and if the utilities are able to gauge to what extent their customers are satisfied, they can devise strategies aimed at improving the aspects of services vital to the customers. Molinos-Senante and Sala-Garrido (2017) suggested that customers should be reimbursed appropriately because they were directly impacted. On the other hand, it was important to remember that water service providers provided drinking water under monopoly regimes, giving customers very little choice because they had nowhere else to turn for the service. Roibas et al. (2018), recommended choosing the rationing technique option as long as the impact on customer satisfaction during the implementation of the rationing plan was taken into account. When it comes to the amount of time it takes for water to become available, rationing systems could be considered deviations, although the anticipated consumer budget was unaffected. On the other hand, Breyer et al. (2018) pointed out that water problem could be solved by limiting the use of water outdoor. Water costs, drinking water quality, supply disruption, water supply pressure, and water supply service are all criteria of improved water supply safety (Wang and Davies (2018). In the higher-risk areas of the population, an unbroken water supply was correlated with a decline in the spread of waterborne disease (Adane et al., 2017). According to Molinos-Senante and Sala-Garrido (2017), providing customers with high-quality service was essential, and as a result, greater investment was needed to minimize unanticipated interruptions. The effectiveness and efficiency of some state water agencies have been impactful and reduce the report of poor water quality; intermittent supplies; low pressure; and several days without supply.

MATERIALS AND METHODS

Jos metropolis is located between latitudes $9^{\circ} 45' 10''$ N and $9^{\circ} 59' 10''$ N and longitudes $8^{\circ} 57' 40''$ E and $8^{\circ} 69' 10''$ E. The study area comprises Jos South and Jos North LGA with their headquarters in Bukuru and Jos respectively. The area is within the northern senatorial zone of Plateau state, and is bounded by Barkin-Ladi and Jos East to the east, Riyom LGA to the south and Bassa LGA to the west(see Figure 1).The Jos metropolis has an elevation of 1,250m above sea level with Shere Hills the highest peak (1,777m above sea level)and an area of 1002.19 Km^2 (Mohammed Gajere, Adigun and Folayan, 2010). Jos Metropolis has an area coverage of Jos North and Jos South LGA of Plateau State which are the major urban centre in the region and Plateau Water Service Corporation (PWSC) is a government owned agency established by Plateau Water Service Corporation Edict No.4 of 1991 of which it was gazetted in year 2020 to be named Plateau Water Service Corporation (PWSC) with a charged responsibility to provide water services from the generation point to distribution to over 3 million water users, beside other water supply projects in other parts of the state as well as individual source of water. The PSWC have 25, 115 connected pipeline to service with water supply, aside of other consumers in the metropolis.



Source: National Centre for Remote Sensing (NCRS) 2020

Figure 1: Jos-Metropolis, Plateau State, Nigeria

Mixed research method was applied for the study to acquire quantitative and qualitative data of human behaviour as unpredictable subject on a population of 25.111 customers connected with PWSC. Because the sample was known, purposive sampling technique was used on the respondents. 21 water supply districts was found in the Jos Metropolis of which seven (7) was randomly selected from Bukuru A-C and Jos A-S include: Bukuru B (Yelwa), Bukuru C(Rahol Kanamg), Jos B, Jos D (Nassarawa), Jos H (Kufang), Jos K (Fudawa), Jos N (FederalLow-cost) and Jos R (Utan). Out of those locations, 423 sample size were distributed evenly using percentage adapted Krejcie and Morgan (1970) approach. Questionnaire, interviews and Focus Group Discussion (FGD) were instrument for data gathering. The questionnaire were multiple questions administered to the respondents to answered and returned to the researchers, interviews was randomly conducted on 38 individuals that are stakeholders of PWSC and customers meanwhile, the FGD was of 3 groups; first group comprises of 7 participants that are stakeholders with PSWC, second group was water vendors and distributors with 8 participants, third group was households (residents) with 8 participants which the data generated were used to complement information collected through questionnaire. However, 372 questionnaires were returned successful. With the aid SPSS version 23.0 data were organized, coded and analyzed base of the purpose of the study and were presented in tabulated format

FINDINGS AND DISCUSSION

Table 1: PSWC Consumers of Socio-demographic Characteristic

Description	Frequency	Percent
Gender		
Male	249	66.9
Female	123	33.1
Total	372	100
Age		
15 – 25	48	12.9
26 – 35	111	29.8
36 – 45	49	13.2
46 – 55	105	28.2
56 and above	59	15.9
Total	372	100
Marital Status		
Single	136	36.6
Married	205	55.1
Widowed	24	6.5
Divorced/Separated	7	1.9
Total	372	100
Type of Marriage		
Monogamy	167	44.9
Bigamy	20	5.4
Polygamy	60	16.1
Others	125	33.6
Total	372	100

Educational Status		
Non Formal	28	7.5
Nursery/Primary	27	7.3
Secondary/Vocational	104	28.0
Tertiary	213	57.3
Total	372	100
Household's Occupation		
Civil servant	83	22.3
Business/Trading	145	39.0
Farming	51	13.7
Artisan	44	11.8
Others	49	13.2
Total	37	100
Total	372	100

Table 1 revealed the demographic details of respondents in the study region shows 84.9% households were male and 15.1% female who participated in the survey with an age range between 46-55 years old has 29.8%. In the aspect of marital status, 55.1% of the respondents were monogamous marriage (44.9%) and 57.3% had tertiary qualification as the highest qualification while major occupation was business among the respondents in the study.

Table 2: PWSC Customers' Housing Types

Description	Frequency	Percentage
Detached building	144	38.7
Bungalow	145	39.0
Duplex	20	5.4
Storey building	24	6.5
Other	39	10.5
Total	372	100
Household Income		
10,000 – 30,000	175	47.0
31,000 – 50,000	85	22.8
51,000 – 80, 000	41	11.0
81,000 – 100,000	56	15.1
Over 120,000	15	4.0
Total	372	100
Tenancy Status		
Privately rented	172	46.2
Owner occupier	181	48.7
Provided by employer	19	5.1
Total	372	100

Duration of Stay		
1 – 5years	91	24.5
6 – 10years	70	18.8
11 – 15years	59	15.9
16 – 20years	67	18.0
Others	85	22.8
Total	372	100

Table 2 shows the type of houses customers reside and connected with pipe-borne water, about 39.0% of the respondents reside in a bungalow, 38.7% resides in detached building, 10.5% in other types of houses and 6.5% resides in storey building while 5.4% resides in duplex buildings. This implies that most respondents who use pipe borne water reside in bungalow. This confirms a literature that stated multitenant was the type of housing the most respondent occupied with a single pipe borne water as a source of their water supply (Aho, et al., 2016). Income of household determine the capacity for a house to connect to pipe borne water of which 47% have earnings between ₦10,000-₦30,000, 22.8% respondents have income of between ₦31,000-₦50,000 and 15.1% of the respondents have ₦81, 000-₦100,000 as income while 11.0% of the respondents had an income of ₦51,000-₦80,000 with 4% of the respondents have an income of over ₦120,000.

This implies that most of the respondent’s income is between ₦10,000-₦30,000 naira as an average earning salary in Nigeria. 48.7% of the respondents are owner occupiers, 46.2% used privately rented apartments and 5.1% of the respondents were living in employers’ apartment, because the highest percentage went for owners occupiers, it will encourage respondents to have water connected to their houses which have shown over 25,000 households were connected to PSWC pipe network. 24.5% of the respondents have stay in their location for a period of 1-5years, 22.8% stayed beyond 20years and 18.8% stayed for 6-10years while 18.0% have stay in their location for 16-20 years while 15.9% have stayed for 11-15 years categorically reveals that respondents have stayed for 1-5 years and understood the nature of water supply to customers.

Table 3: Customers Source and Potential Need of Water Supply

Description	Frequency	Percent
Primary source of water supply		
Pipe borne water	216	58.1
Well	118	31.7
Borehole	28	7.5
Vendor	8	2.2
Surface water sources	1	.3
Others	1	.3
Total	372	100
Benefits derived from piped water supply in Jos Metropolis		
Improved health of household members	98	26.3
Save time	47	12.6
Reduced distance to water points	105	28.2
All of the above	122	32.8
Total	372	100

Duration (in hours) of water supply experienced daily		
One Hour	110	29.6
Two hours	190	51.1
Three hours	39	10.5
Above three hours	33	8.9
Total	372	100
Quantity of water (in litres) received in a day from PWSC		
100 -200	132	35.5
201 – 300	112	30.1
301 – 400	75	20.2
401 – 500	36	9.7
Above 501	17	4.6
Total	372	100
What is your household need of water per day in litres per head?		
40 – 80litres	102	27.4
81 – 120litres	121	32.5
121 – 160litres	105	28.2
161 – 210litres	12	3.2
Over 211litres	32	8.6

Details on the nature of water supply was displayed on table 3, Pipe borne water is predominantly the primary source of water supply to households with 58.1%, followed by 31.7% of well water, then 7.5% of borehole water and 2.2% water supplies by vendors while 0.3 are respectively between surface water source and others. The highest percentage of 58.1% source of water was from pipe borne as a major source water supply in Jos-Metropolis that agreed with the Plateau state government for saddling the responsibilities of municipal water supply to PSWC in 1991. The benefits derived from water supply through PSWC pipe borne water revealed 32.8% of the respondents' agreed to the fact that all that was mentioned were accruing benefits of pipe borne water supply (improved health of household member, time saving and reduced distance from accessing water, 28.2% agreed that water supply reduced distance to water point and 26.3% have the believing water improved health of household members while 12.6% save time. The implies water supply through pipe borne improved well being of the respondents (WaterAid, 2014; GLASS, 2014; UNDP, 2006). Duration of water supply to customers was considered, 51.1% of customers stated that water supply last for two-hours, 29.6% enjoyed water supply only one hour and 10.5% have experience water supply for three (3) hours while 8.9% have water supply to households above three (3) hours. This shows that water is supply to households on two hours bases is poor intermittent water supply. The intermittent supply of water vary with the utility as there exist no standard for intermittent water supply, a household survey in India revealed only 7% of respondents with piped water reported having 24 h of supply per day, with average hours per state ranging from 1 to 12 hours (Desai et al, 2007). An average of 35.5% households received 100 – 200 Litres in a day from PWSC, 30.1% received 201 – 300 Litres then, 20.2% received 301 – 400 Litres and 9.7% received 401 – 500 Litres while 4.6% receives above 501litres to satisfy the need for water per day per person. And 81 – 120 Litres of water supply is needed for 32.5% households; 121 – 160 Litres needs water supply for 28.2% households then, 40 – 80 Litres of water supplies to 27.4% households and 8.6% needs water supplies to their households for over 211 Litres while the minimal needs of water supply is 3.2% household for 161 – 210 Litres. thus, 81-120 litres of water supply was the highest percentage representation and this agrees with the WHO/UNICEF Joint Monitoring Programme, responsible for the Global Assessment of Water Supply and Sanitation data, states that reasonable access to water is 'the availability of at least 20 Litres per person per day from a source within one kilometre of the users dwelling' (WHO and UNICEF, 2015) which implies an average household of 5 members need 100 Litres per day which agrees with Litres of water received from PWSC on the day water

is supplied.

Table 4: Customers’ Satisfaction of Quantity and Quality of PWSC Water Distribution

Description	Options	Frequency	Percentage (%)
The Quantity of Pipe borne water supplied to your household at each interval serves your household.	Strongly Agreed	61	16.4
	Agreed	158	42.5
	Neutral	79	21.2
	Disagreed	51	13.7
	Strongly Disagreed	23	6.2
Total		372	100
PWSC pipe borne water supplies to your household are of good quality to meet to your potable water need.	Strongly Agreed	87	23.4
	Agreed	154	41.1
	Neutral	40	10.8
	Disagreed	70	18.8
	Strongly Disagreed	21	5.6
Total		372	100
PWSC Pipe borne water supplies to households are unsuitable for use because of colour and taste.	Strongly Agreed	81	21.8
	Agreed	115	30.9
	Neutral	53	14.2
	Disagreed	79	21.2
	Strongly Disagreed	44	11.8
Total		372	100
PWSC pipe borne water supplies often have certain traceable particles.	Strongly Agreed	114	30.6
	Agreed	124	33.3
	Neutral	50	13.4
	Disagreed	47	12.6
	Strongly Disagreed	37	9.9
Total		372	100

Table 4 reveals the quantity of pipe borne water supplied to household, 42.5% of the respondents agreed that the quantity supplied serving their household usage, 21.2% were neutral to the quantity supplied but 16.4% of the respondents strongly agree while 13.7% and 6.2% of the respondents disagree and strongly disagree respectively. This implies that majority of the respondents agree with the fact that the quantity of pipe borne water supplied to their households at intervals serves them which agrees with Innocence, et al, (2020) that water can made available in stages. The quality of water is essential for human use and consumption; customers’ satisfaction must require the water to be of quality and 41.1% of the respondents agreed that water supplied is portable of quality, 23.4% strongly agreed but 18.8% of the respondents disagreed as 10.8% while 5.6% of the respondents were neutral in their opinion. This implies that majority of the respondents are of the opinion that the quality of water supplied usually satisfy their potable needs of quality as the biological, physical, and chemical characteristics of the water free of harmful microorganisms and poisonous substances (Bos, Alves, Latorre, Macleod, Payen, Roaf, & Rouse, 2016). The suitability of the water supplies base on colour and taste of PSWC pipe borne water was inquired. 30.9% of the respondents agreed that water supplied PWSC was unsuitable, 21.8% of the respondents strongly agree but 21.2% of the respondents disagreed and 11.8% strongly disagreed while 14.2% were on the neutral. This shows that majority of the respondents are in the opinion that water supplied by the PWSC are unsuitable base to colour and taste. Also, in the same vein, PWSC pipe borne water supplied assumed to have certain traceable particles which were inquired and 33.3% of the respondents agreed that there are traceable particles in the water supplied by PWSC, 30.6% strongly agreed and 13.4% of the respondents were neutral while 12.6% and 9.9% of the respondents disagreed and strongly disagreed respectively. This reveals that majority of the respondents are of the opinion that there are traceable particles in the water supplied by PWSC.

Table 5: Customers’ Satisfaction towards PWSC Service Payment

Description	Options	Frequency	Percentage (%)
Is the period stipulated for payment of water supplied fair enough for your household?	Very Fair	75	20.2
	Fair	183	49.2
	Neutral	69	18.5
	Unfair	35	9.4
	Very Unfair	10	2.7
Total		372	100
PWSC pipe borne water rate charges is relatively fair at rate of supply.	Very Fair	51	13.7
	Fair	155	41.7
	Neutral	91	24.5
	Unfair	67	18.0
	Very Unfair	8	2.2
Total		372	100

Field Survey, 2021

The period stipulated for payment of water supplied could be another measure of assessing customers' satisfaction. When consumers are not giving adequate time to pay their water bills, it could bring e a short fall to satisfaction. Table 5 revealed 49.2% of the respondents were fairly satisfied with the stipulated time to pay for water supplied 20.2% were very satisfied and 18.5% were of neutral opinion while 9.4% were stated their dissatisfaction of the stipulated time of paying water bills as well as 2.7% of the respondents were very dissatisfied with payment period. This implies that majority of the respondents attested that the period stipulated for payment for water supplied is fair enough for households to pay their water bills. Another area of concern was the rate at which water supplied is charge by the PWSC. 41.7% of the respondents affirmed that the charges are fair, while 24.5% of the respondents were neutral about their opinions and 18.0% of the respondents stated their displeasure towards charges for supplied, the same with 13.7% of the respondents were strongly displeasured. However, PWSC rate of charge for water supplied was fair base on the finding of the study.

Table 6 Customers' Satisfaction of PWSC Water Distribution

Description	Options	Frequency	Percentage
What do you think of the quality of water from pipesystem of PWSC?	Very Efficient	71	19.1
	Efficient	51	13.7
	Undecided	185	49.7
	Inefficient	44	11.8
	Very In efficient	21	5.6
Total		372	100
You are satisfied with the quality and quantity of pipe borne water supplied by PWSC	Very Efficient	62	16.7
	Efficient	105	28.2
	Undecided	58	15.6
	Inefficient	145	39.0
	Very Inefficient	2	0.5
Total		372	100
PWSC water distribution satisfy the needs of waterin your household	Very Efficient	45	12.1
	Efficient	54	14.5
	Undecided	75	20.2
	Inefficient	172	46.2
	Very Inefficient	26	7.0
Total		372	100

Is PWSC pipe borne water quality, quantity and price satisfactory for your household need for water?	Very	61	16.4
	Efficient	67	18.0
	Efficient	97	26.1
	Undecided	116	31.2
	Inefficient	31	8.3
	Very Inefficient		
Total		372	100

Customers’ satisfaction are vital to achieving the endpoint of any Water Corporation, especially with water distribution, situation whereby, water is efficient and effectively distributed, customers will be satisfy with water supply. Table 6, revealed 49.7% of the respondents were neutral the quality of water from the pipe system, 19.1% of the respondents affirmed to be very Satisfied in quality while 13.7% of the respondents were satisfied but 11.8% of the respondents were dissatisfied pipe water quality and the same with 5.6% of the respondents were also strongly dissatisfied. This revealed that majority of the respondents are neither satisfy nor unsatisfied with the quality of water from piped system. The water distributed satisfies the need of water in household had been investigated. Moreover, water distribution is another aspect of customers’ satisfaction and 46.2% of the respondents were dissatisfied while 20.2% of the respondents were neutral toward the opinion of water distribution but 14.5% and 12.1% of the respondents were satisfied and very satisfied with water distribution respectively. Only 7.0% of the respondents were very dissatisfied with water distribution. This shows that majority of the respondents are not satisfied with the distribution of water in their household. To certain of customers’ satisfaction, the quality, quantity and price satisfactory for households need for water was inquired and 31.2% of the respondents were dissatisfied with the quality, quantity and pricing of water supplied by PWSC, 26.1% of the respondents remained neutral, whereas, 18.0% and 16.4% of the respondents were satisfactory and very satisfied respectively while 8.3% of the respondents are very dissatisfactory with the quality, quantity and pricing of water supplied by PWSC. This reveals that majority of the respondents are dissatisfactory with PWSC water supply.

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.266 a	.071	.034	.463

1. Predictors (Constant) Water supply from PWSC

Dependent Customers’ satisfaction

Linear Regression was used and model summary revealed that the R² value of 0.71 indicates that 71 % of the variables of customers’ satisfaction to municipal water supply in Jos metropolis can be explained by the model of water supply from PWSC which is quite high predictions of the linear regression equation and very good. It also means that 29 % of the variation is still unexplainable.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.280	.139		9.195	.000
Water quality, quantity and price satisfy customers	-.041	.023	-.104	-1.779	.076
Water distribution satisfy the needs of water in your household	-.015	.026	-.035	-.566	.572
Water charges rate is relatively fair	.017	.028	.035	.593	.554
Stipulated time for paying water bills	-.037	.029	-.077	-1.272	.204
Quantity and quality of pipe borne water supplied	-.015	.023	-.040	-.666	.506
Quality of water supply from PWSC	.060	.025	.138	2.406	.017
Traceable particles in water supply	.020	.022	.055	.913	.362
Unsuitability for usage due to colour and taste	.023	.022	.067	1.090	.276
Quantity of water supply to households	-.006	.024	-.015	-.247	.805
Interval water serves your household	-.005	.025	-.011	-.183	.855
Time between the intervals of water supply is optimal	.013	.028	.028	.463	.643
PSWB water distribution to customers is stable	-.049	.028	-.104	-1.745	.082

a. Dependent Variable: water supply

The regression model on the customers’ satisfaction on municipal water supply in Jos-Metropolis assume that among all variables (independent) water quality quantity and price satisfy customer (0.076), water distribution need of households (0.572), water charges rate relatively fair (0.554) stipulated time for paying water bill (0.204), quantity and quantity of pipe borne water supply (0.506), quality of water supply from PWSC (0.017), traceable particles in water (0.362), unsuitability for usage due to colour and taste (0.276), Quantity of water supply to households (0.805), interval of water supply serves (0.8550, time between the interval serves is optimal (0.643) and PWSC water distribution to customers is stable (0.082) have strong insignificance on Water supply from PWSC at 0.001 and 0.05 as the regression coefficients are relatively higher. Only the quality of water supply to households shows significance at 0.05 which indicated that customers are not quite satisfy the water supply from PWSC.

CONCLUSION

The demand for water supply as a result of increasing population has necessitated the need to distinguish customers’ satisfaction of water supply from the Plateau Water Service Corporation (PWSC) in Jos-Metropolis. This however, made the study to succinct the customers’ satisfaction on a steady supply of water to meet consumption needs in the broadest sense of spatial coverage, quality and quantity as well as rate charges per supply to the feeling of pleasure that customers have after using water supply. The investigation shows that water has improved health of customers with intermittent supply of an average of hours of water supply and 81-120 litres per supply of which customers are satisfy with quality, even though colour and taste are sometimes unsuitable. Traceable particles are also found in the water supply to customers that could be as a result of aged pipes which water distributed to the Metropolis. Consequently, customers’ satisfaction is reliant on the distribution of sufficient quantity, reliable quality water for sustainable health. Despite a major affirmation to the quantity and quality of water supplied to serve and satisfy households, yet attestations to,

coloured tasteful and particle filled water supplied were stated, however customers demonstrate non-satisfaction to the quality, quantity and price of PWSC water supply. The need to be efficient towards water supply is a vital tool in attaining sustainable development goal SDG (6th) on water. Households access to sufficient water supply is guaranteed if bodies saddle with responsible to make water available to consumers are proactive to meet up with the SDG goal on water. This however, recommend total modeling of PWSC water distribution strategies to meet the global standard for efficient water distribution from the source of water generation, capacity in quantity and quality in accordance to the existing modalities. And customers connected with PWSC water service should be enlightened on the need for prompt payment of water service to boast service delivery of quantity and quality of water supply while avenue should be created for customers to channel complains or any other service required.

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