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**WATER, SANITATION AND HYGIENE SERVICES BEYOND 2015:
IMPROVING ACCESS AND SUSTAINABILITY**

Mobile-enabled payment as an innovative water utility cost recovery method in Nigeria

E. E. Ezenwaji & B. M. Eduputa (Nigeria)

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This paper assesses the contributions of Mobile-Enabled payment method for the improvement of finance of a water utility company in Nigeria, during the first four years (Jan 2010 – Dec 2013) it practiced the payment method. Towards achieving the aim, two sets of questionnaire totalling 503 were designed and administered. Collection of data was achieved between June and December, 2013 after which they were analysed with the use of simple statistical methods. The result shows that the Water Company (Lokson) started operation in January 2010 but by December 2013, 50% of households in its area of operation were already being served by the Company, while bill defaulters have decreased from 80% in 2010 to 44% in December 2013. The success of the method as well as its obstacles were discussed and recommendations made on how the payment method would be improved.

Introduction

Mobile-Enabled payment done through mobile phones and banks is a new method of bill payment for electricity services, satellite TV subscription, agricultural products, educational fees and levies, and a range of other services in sub-Saharan Africa. Mobile Money can be explained to mean an electronic payment system that enables money transfers to and from an electronic account that can be accessed through an ordinary mobile phone. It can therefore profitably extend the reach of financial services to those who have traditionally been unbanked such as low-income or remote households (Hope, Foster, Krolikowski and Cohen, 2011), while Mobile Banking is a system that allows water consumers to pay their water bills to the bank through a mobile device such as a mobile phone. This can be done when a consumer uses his phone to dial *326# to get registered. This will enable the system to generate a Personal Identification Number (PIN) from where an electronic wallet or purse is created that enables the customer to pay-in money into the wallet. When this is done, the customer begins his transaction from the wallet through his phone. Currently there are attempts to extend the model to the payment of water services in some parts of Africa. This payment system has proved quite effective in ensuring that costs of services from these sectors are recovered without financial leakages intrinsic in traditional payment methods. According to Krolikowski, Fu and Hope (2013) if traditional payment methods are like leaky pipes, then mobile-enabled payment options use mobile networks and technologies to patch up those leaks. Mobile methods create payment channels that are more fully closed, thereby preventing the loss of revenues and enables more information and financial resources to enter the system for the improvement of water services. Mobile-Enable payments are most commonly used in Nigeria in two areas: payment of school fees and payment of subscription fees in satellite TV stations. On the relevance of this finance innovation to WASH, there is no doubt that water and sanitation sector is seriously underfunded in sub-Saharan Africa leading to the deterioration and potential collapse of the infrastructure because of poor operational and maintenance system in place (Borkey, 2010). However, some world bodies recommend that the main way of solving the persistent financial problem in the sector in the long, medium and short term is to ensure that revenue for the services are promptly recovered. This according to (OECD, 2009a) can be achieved through structural reforms aimed at improving the sector's internal revenue-generation and collection potential. The inability to generate and recover enough revenues for the sustainability of the system is as a result of general poor work attitude by officials of water

authorities and mismanagement of public funds by the heads of such authorities. The very common traditionally recommended panacea to solve the problem is to seek for new funds from donor agencies which are used as the main fund for the running of the system while the internally generated revenue which come mainly from payment of water bills are used as supplementary, but this should not be. The realization that consumers in the residential sector in some sub-Saharan African countries owe large sums of money to water companies in terms of unpaid tariff, has made such countries to put in every effort to ensure that water tariffs are promptly paid as required. It is in an attempt to explore this source of revenue to improve water and sanitation services that made many countries in the sub-Saharan Africa to adopt the use of mobile telephony and related innovations. Gray (2013) noted that some of the countries that are now piloting this new concept are three East African countries namely Tanzania, Kenya and Uganda who may be leading sub-Saharan Africa into a new era of urban water provision. The effort of these countries to ensure that combinations of poor operational performance and insufficient cost-recovery traps are solved, necessitates the adoption of the new payment method which according to Hope, Foster, Krolinkowski and Cohen (2011) will improve poor billing and payment systems, check incessant corruption, distributional losses and the entrenched over staffing. Okim (2014) was of the view that this new payment model will help in no small way to ensure financial sustainability of the water sector in developing countries.

Preliminary field study of some Public Water Utilities in Nigeria indicates that none of them has adopted the use of mobile finance innovations, and revealed that some privately owned water utilities companies are gradually embracing the method. This paper, therefore, seeks to assess the use of Mobile-Enabled payment model by Lokson Water Utility Company in Onitsha urban area, Nigeria.

Background

Most Public Water Utility Companies in Nigeria are either operating at very low capacities or have completely collapsed and rendering no service. The gap created by their absence is gradually being filled by small and large private water companies. The small companies hire casual staff to use trucks or wheelbarrows to retail water in 25 litre or 30 litre jerry cans, while the big time private companies use water tankers to hawk water in streets especially to mainly residential consumers. However, this is not applicable to the Lokson Water Utility Company as it is part of the new private water companies that have their water source, usually the borehole from where they pump water to designated public points through a local water distribution network. The cost of water at these points is determined by either a bulk or private meter.

In Onitsha urban area of Nigeria, water supply is very poor to the extent that it only satisfies 60% of demand in 2012 (Adiugo, 2013). Based on this prevailing poor situation many water companies have sprang up not necessarily to fill this gap in water supply but to exploit the situation for business gains. Lokson Water Utility Company is one of such companies which began operation in 2010 and has ever since maintained a steady water supply to customers, delivering water for 20 out of 24 hours of the day in Awada area of the town. The company currently has a customer base of 403 households with an average supply of 200 litres per household per day. At inception, the Company adopted both traditional as well as mobile payment system but over 80% of its customers now use Mobile-Enabled payment system. The Company exploited the vast population of mobile telephone owners to embark on the payment.

Methodology

Data were collected from the Water Utility Company as well as other organisations connected with the payment method by use of questionnaire of which 503 were designed and served. Data from customers were collected by serving questionnaire to all the 403 households connected to Lokson Water Utility Company. Five research assistants were engaged to serve and retrieve the questionnaire from the respondents between June and December 2013. One of which 100 questionnaire were reserved on the Utility and other bodies connected with the payment method 30 were served on the staff of Lokson Water Utility Company headquarters and 4 each to its 5 field officer in the area, 6 to network service providers as follows; 2 to each of three network operators in the area namely MTN, Etisalat and Airtel. 20 were served on the Ministry of Public Utilities officials in Onitsha, and 24 which is 4 each to 6 major banks in the town. 403 questionnaire were served on the existing number of households that presently constitute its customers.

Data analysis

Simple statistical methods such as percentages, means, bar graph etc. were employed in the analysis of data to establish patterns and relationships. Data were analysed with the use of the statistical package for social sciences (SPSS) version 20 run on Windows® 8.1.

Results

At the end of data analysis, the following results were achieved.

Table 1 shows the demographic database of the study area in 2013. Out of the total population of 5,364 (800 households) in the area, Lokson Water Utility Company has by that year captured up to 2,683 customers representing 403 households. This shows that in its four years of operation, the utility company attracted about 50% of the population of the area as customers. Among all the Zones, Zone V performed best in this regard with 63% of the population as the company's customers while Zone II had the lowest performance of 40%. The payment data before the coming of Lokson Company in 2010 show that when the Public Utility Office (Onitsha Water Corporation) was in charge of water delivery, 81% of its total 5067 customers owed water bill (Table 2).

Lokson water zone	2013 population*	Number of households	Average size of household	Number of Lokson customers		% of customers over total population
				individuals	Households	
Zone I	1064	152	7	644	92	61
Zone II	1008	168	6	400	67	40
Zone III	1092	156	7	452	65	41
Zone IV	1024	128	8	446	56	43
Zone V	1176	196	6	740	123	63
Total	5,364	800	Mean 7	2682	403	Mean 50

* Projection from 2006 census figure.

Zones	Payment method used	Location of payment	Number of customers of public utility	Number of customers that do not owe water bill	Number of customers that owe water bill	% that owe 2010 bill
Zone I	Traditional	Public utility office	1010	104	906	90
Zone II	Traditional	Public utility office	980	213	767	78
Zone III	Traditional	Public utility office	994	169	825	83
Zone IV	Traditional	Public utility office	973	245	728	75
Zone V	Traditional	Public utility office	1110	211	899	81
			5067	942	4125	81

Payment situation of customers of Lokson Water Utility Company in 2013 indicate that the percentage of customers who pay by Mobile-Enabled payment in three years of its operation was 87% (Table 3).

From theTableit could be deduced that those owing the Public Utility Company has gone down from 81% (Table 2) to 13% (i.e. 87% that now pay water bill subtracted from 100%). This is an outstanding achievement for a company that was in business for only 4 years.It is however expected that within the next few years, this remaining 13% will no longer be there as every customer may start paying their water bills with the new method. This assertion stems from the observed rate by which customers are accepting the newmethod.Fig. 1 shows that the Mobile-Enabled payment has received very wide acceptance within this period. However, it could be seen that mobile banking is growing more than other products, because people are now fast acquiring banking culture in the area as a result of recent government introduction of cashless policy in the country. From the figure it could be seen that those who pay through traditional method continues to experience sharp continuous decrease.

Table 3. Payment Data in 2013, four years after Lokson start-up year

Zones	Total number of customers 2013	No of customers who pay by traditional methods	No of customers who pay by mobile money	No of customers who pay by mobile banking	Total number of customers who pay by mobile-enabled method	% of customers who pay by mobile-enabled method over the total number of customers
Zone I	92	10	21	61	82	89
Zone II	67	4	12	51	63	94
Zone III	65	8	17	40	57	88
Zone IV	56	11	15	30	45	80
Zone V	123	21	30	72	102	83
Mean	81	11	19	51	70	87%

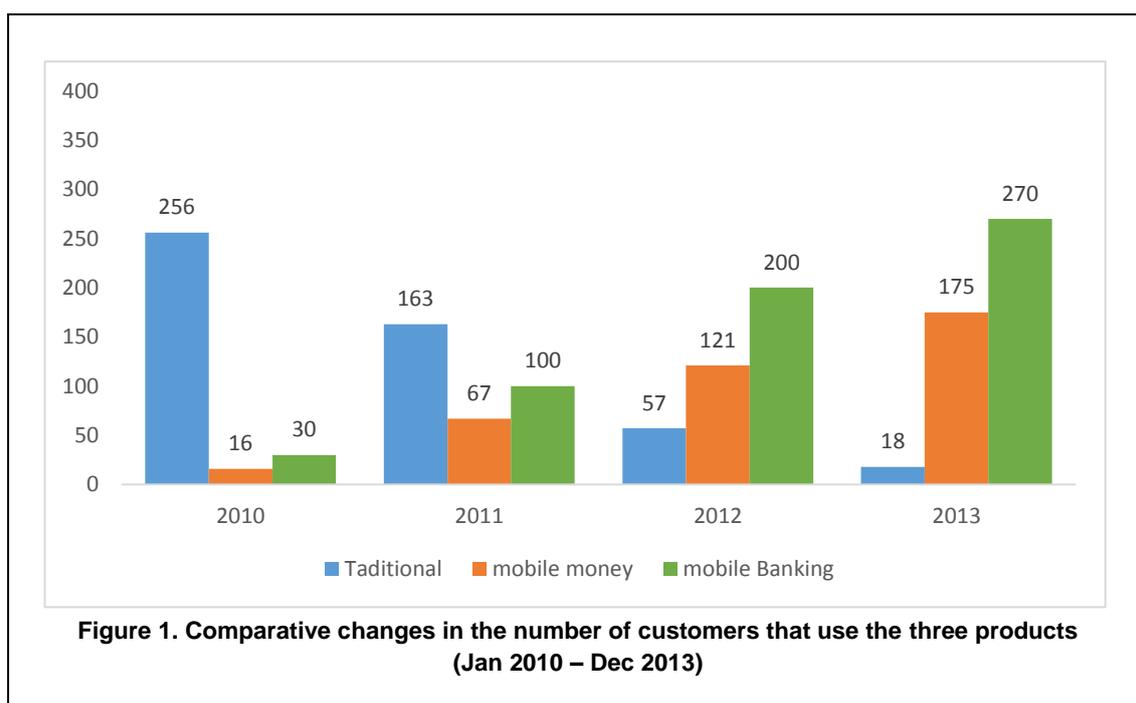


Figure 1. Comparative changes in the number of customers that use the three products (Jan 2010 – Dec 2013)

Discussion

The mobile-enabled payment system adopted by the Lokson Water Utility Company, a privately operated Water Utility Company is quite new to the Nigerian environment. This payment system according to Hope, Foster Krolkowski and Cohen (2011) represents a secure low cost and increasingly accessible mechanism to support the financial and operational sustainability of urban water services. The ability to remotely pay for water bills offers customers both time and money savings. This innovative method has made it possible for the water company to achieve tremendous improvement in the recovery of the cost of their water supply. It should therefore be concluded that the major reason for the payment default in the past were as a result of the inconvenient traditional payment option of the past.

Since Lokson began operation, it was difficult for many customers to switch to the new payment system. The General Manager of the company noted that the company's revenue has been increasing while simultaneously reducing the administrative burden of bill processing. This remark was equally made by Krolinkowski, Fu and Hope (2013) when they noted that these gains could help any Water Service Provider (WSP) to strengthen its financial base.

Lokson Water Utilities Company presently partner with three Mobile Network Operators (MNOs) to operate the new payment system. The MNOs charge minimal operational fee to each mobile payment based on terms of agreement reached in the memorandum of understanding with the company while the banks also require customers to pay a token as service charge.

The successes of this innovative payment method relate to both the customers and the company. On part of the customers, they save considerable amount of time and money compared to other customers who still pay through traditional methods. Customers now have enough authority to hold service provider accountable because they no longer owe the company as a result of new payment method which makes it possible for most of them to conveniently pay their bills on time. In terms of time, most customer now trek to the office of the mobile agent to load money to mobile account, or to nearby bank to pay water bill, because these points are now near to customers, contrary to the situation of those who still use the traditional method that travel longer distances to water offices to pay. Again money is saved because of the inherent corruption that characterise the traditional system such as billing customers on estimation as most water meters were either dysfunctional or stolen. The water meters are still in use although the company is doing everything possible to reduce billing by estimation that was rampant under the traditional system by ensuring that all customers are billed through water meter.

For the Company, the benefits are equally outstanding. First the company collects more revenue per customer under mobile-enabled payment than was the case under the traditional method. Second under the traditional payment method, petty corruption abound, because cash based payment pathways lose a significant amount of the resources (payments) as it travels through the channel (Krolkowski, Fu and Hope, 2013). Under the traditional payment methods, complaints of unbalanced daily account by staff in charge were rampant because some staff were accused of stealing some "small" amounts of money from the daily collected amounts. Thirdly, the Company now receives payments made by customers instantly while better records embedded in the electronic transfers make accounting easier. Fourthly, the company by switching to mobile-enabled payment system reduces recurrent costs with reduced staff and closure of some water offices. Generally, this payment system generates reliable data that enhances transparency of the company. The gains of the innovative method as we have seen are many but currently none of these is passed to the customers.

In spite of these successes, there are manifest barriers to this payment method.

- **Poor knowledge of use of telephony handset.**

In Onitsha, Nigeria, majority of the customers still find it difficult to operate the new system. Our findings revealed that many adults only know how to use their telephony handsets to make and receive calls. They find it difficult to learn how to make use of numerous services available in the handset. Some of the heads of households do not make payment through mobile means unless their children operate the phone to make the payment. In this regard water companies should educate customers on the use of mobile phones for payment.

- **Absence of paper based receipts in mobile-enabled payment**

Another problem of Mobile-Enabled payment is the inability of the system to make paper receipts available to customers upon payment. In Nigeria, people rely so much on paper receipts for any payment because they believe that such receipts are the only proof of payment and defence against disconnection. This has assuredly hindered wider acceptance of the innovation.

- **Poor service provision by the mobile network companies**
In Nigeria, one of the biggest barriers to this payment method is the poor network service of mobile service providers. Many respondents complained that most often when they wanted to make payment, they find that service from the network was not through. Some said when faced with this problem that they usually divert the money meant for water bill to other uses while others complained that they suffer the inconveniences of either going to the bank or water offices to make payment.
- **High transaction tariff rates**
Respondents complained that the Mobile Service Providers charge high transaction rates and as a result they find it difficult to use the new payment methods because of these rates. The mobile service providers charge high tariff per transaction which usually constitute a large percentage of their water bill. This is not so with the micro finance banks which now charge them little rates and indicates another reason why mobile banking is preferred to other products.
- **Poor banking culture of some water customers**
Some customers of Lokson Water Company do not like going to the bank for any transaction because of their poor literacy level. This group of customers do everything to avoid dealing with the bank on any matter including depositing funds. Onitsha, one of the largest commercial centres in West Africa is largely populated by traders majority of whom hardly finished their primary school education and as such have phobia for banking transactions because of their low literacy.

Recommendations

- Water service providers should embark on sustained sensitization and education of the customers on the use of telephony handsets to make water payments as well as imbibe the culture of banking transaction.
- Confirmation of payment of SMS messages by the Mobile Service Providers will help to improve trust in the service and reduce hesitancy to adopt the option. It will also limit complaints about the non-issuance of paper receipts.
- Mobile service providers should be made to improve their services so that real time payment could be made easily by customers.
- Both the Mobile Service Operators and Banks should be appealed to reduce their transaction tariff. This will no doubt increase the volume of mobile-enabled payment transaction in the sector.

Conclusion

This paper has examined the use of Mobile-Enabled payments as an innovative water utility cost recovery method in Nigeria. Presently the funding of water services by donor partners and budgetary provision methods by governments have not completely solved the financial problems of the sector because of poor payment attitude of customers that was entrenched in the traditional payment product, therefore necessitating the search for an alternative. One of those alternatives – Mobile-Enabled payment was examined in Lokson, a small privately own water utility company in Onitsha, Nigeria. From the study it was revealed that 403 households or 2,682 persons are already connected to the water service provider. Equally revealing is the fact that those paying their water bills to the company through the traditional method are reducing while those paying through new system have increased outstandingly with the mobile banking system capturing the interest of most customers, (see Fig. 1). The benefits of this system were outlined as well as its inherent barriers. The implication of the study for those involved in WASH programme is that proper development of this payment method would help generate reliable data to support higher quality decision making that would drastically improve the financial sustainability in the sector.

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Contact details

E. E. Ezenwaji
Department of Geography and Meteorology
Nnamdi Azikiwe University, Awka, Nigeria.
Tel: +2348033609088
Email: emmaezenwaji@gmail.com

B. M. Eduputa
Department of Environmental Management,
Nnamdi Azikiwe University, Awka, Nigeria.
Tel: +2348057359844
Email: bedeeduputa@yahoo.com
