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An analysis of urban residents' efficiency in paying for water services delivered by municipalities: A case of Chinhoyi Town, Zimbabwe

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ABSTRACT
Chinhoyi urban local authority is failing to deliver obligated services such as water provision to residents, citing unavailability of funds due to non-payment by the residents as the main cause. This research aims at establishing whether or not this deterioration in water provision is indeed due to non-payment by citizens. Ten households were randomly selected from each of the sixteen residential areas in Chinhoyi. Each of the households was given a questionnaire to complete and the responses were analysed using Limdep and SPSS. The efficiency of residents in paying for water services was estimated using the Stochastic Frontier method. The factors that were used in the model were either quantitative or ordinal-qualitative. A likert-scale with ratings 1 to 5 was used for the ordinal factors. Results show that residents are paying for the water services provided by the municipality, suggesting that the poor supply of water by the Chinhoyi municipality is not due to non-payment by citizens. These results imply that revenue being collected from residents is either not sufficient for the provision of water or has a part that is being directed elsewhere. It was also established that water quantity, amount charged, household income, opportunism and inability significantly affect the amount of revenue paid to the municipality by the residents. The effect of opportunism and inability was, however, negative. Implying that an increase in each of the two factors reduces both the amount that a household will pay and the efficiency of the individual household.

Contribution/Originality: The estimation of efficiency in revenue collection processes is totally new to local authorities. Researchers who have written on the concept of efficiency estimation in local authorities only use the terms but do not estimate efficiency. This study is original in that efficiency itself is estimated, not revenue collection. In addition, for Chinhoyi, no study that has to do with this local authority has been done.

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1. BACKGROUND
In order to efficiently run the affairs of their areas of jurisdiction, local authorities need reliable revenue sources. Service delivery, which is one of the major reasons why local authorities are put in place, is compromised when funding is inadequate.

All urban local authorities worldwide rely heavily on their own revenue sources. These sources include property tax, income generating projects, rents and user charges, where user fees are charges that are paid to local authorities by residents for the services provided to the latter by the former. These fees are either, service fees, for example, fees

paid for getting a marriage certificate or public prices, for example, revenue from the sale of private property. Most countries in the world have user fees on water, health, education and electricity, (Zhou & Chilunjika, 2013). These charges are sometimes referred to as 'service charges' and consist of levies for services rendered by the municipalities, like sewerage fees, rent for municipal halls, fees for the removal of refuse and ambulance fees (Cloete & Thornhill, 2005). he remaining part of the paper is organised as follows: Section 2 provides the theoretical context of non-payment. Section 3 gives the methodology of the research. Section 4 analyses the results and section 5 discusses the results and concludes.

2. THEORETICAL CONTEXT OF THE NON-PAYMENT PROBLEM

Non-payment for services provided by local authorities is an issue, not only in Zimbabwe, but in the whole world, especially in Africa. Reasons that the literature cites for non-payment include poverty due to unemployment, political rivalry, the cultural habit of non-payment, dissatisfaction with the quality of services, perceived mismanagement of funds, a lack of consumer participation and opportunism. A fiscal relationship exists between urban local governments and citizens because the local governments provide services and the citizens pay for those services, (Levi, 1997). In addition, this relationship is interdependent and complex in that citizens' payment depends on service provided by municipalities while service delivery by municipalities depends on payment by citizens.

2.1. Dissatisfaction with Service Delivery

There is a gross fall of service delivery in urban areas of Zimbabwe, Mugumbate, Maushe, and Nyoni (2013). All major urban centres including Harare, the capital city and Chinhoyi, the provincial capital of Mashonaland west province, are facing serious shortages of water. Citizens go for weeks, sometimes for months, without water, a basic commodity. The roads are in a state of shame, and when you walk along the streets, you see piles of garbage almost everywhere and in every town. The authorities do not have enough money to provide the required services yet they are owed billions of dollars by the residents. This dissatisfaction with service delivery is one of the major causes of non-payment by citizens. Studies carried out on non-payment include (Chanyau, 2014; Mabika, 2015; Moyo, 2016; Mudyanadzo & Nzwatu, 2018; Tonhodzai, Nyikadzino, & Nhema, 2015; Wozhele, 2017) and have all shown that citizens of urban centres are unwilling to pay when they are not satisfied with the services. Wozhele (2017) contends that service delivery and consumer willingness to pay for services delivered by municipality are positively correlated. Simply put, an improvement in one results in an improvement in the other. Asare (2015) and Scott (2018) point out that when service delivery is poor, ratepayers refuse to pay. Citizens believe that there is no need to pay municipal taxes and rates where there are no benefits. This action of non-payment is supported by Boamah (2013) who argues that municipalities should not demand payment for services that are not adequately provided. Research by Adenya and Muturi (2017) shows that poor service delivery affects ratepayers' willingness of to pay for municipal services. Lita (2013), for example, contends that inadequate service delivery encourages non-payment to municipalities.

Because of the interdependence between the consumers and service providers, municipalities, as service providers, argue from their side, accusing ratepayers for non-payment, which leads to inadequate service delivery, (Chanyau, 2014; Mabika, 2015; Moyo, 2016). Tonhodzai et al. (2015) claim that municipalities fail to provide expected services due to lack of financial resources. The financial shortage is mainly a result of non-payment by residents.

The decision to or not to pay derives from the perception that the local authority will provide the services that are paid for. When these services are undelivered, even the element of coercion that is seen in imposing fines and penalties does not work. A good example is in the attempt by the urban local authorities of Zimbabwe to disconnect defaulters from the water supply system when the municipalities are not supplying the water at all. Such measures do not make sense since they do not inflict any pain to the defaulter. In addition, the defaulter is unlikely to be pushed by such a measure into taking any positive action.

2.2. Inability Due to Poverty

Non-payment of bills is not always an issue of unwillingness to pay but is more of an inability to pay, (Botes & Pelser, 2001). They maintain that there is nothing like a non-payment culture. It is poverty that incapacitates residents into this non-payment behaviour, they argue. Since the collapse of industry in 2000, unemployment has been rampant in Zimbabwe. Because of the high levels of unemployment, residents are suffering and cannot spare money for service provision. Instead of paying municipality bills, residents prioritise other bills like medical, Poperwi (2018). Poverty, therefore, is related, not the willingness but to the ability to pay.

Unemployment levels in Zimbabwe have affected ratepayers' capacity to pay, (Wozhele, 2017). According to Zivanai, Manyani, Hove, Mabhungu, and Muza (2014), income levels have a significant impact on their ability to pay. This view is echoed by Kucherera (2014) who claims that municipalities' ability to collect revenue is affected by the poverty of their communities. The poor performance of the Zimbabwe economy has worsened the non-payment situation by plunging hundreds of thousands of citizens into poverty, (Moyo, 2016).

2.3. Opportunism

The Urban Councils Act (Chapter 29:15) and the Rural District Councils Act (Chapter 29:13) provide the tools that are used by the Ministry of Local Government Urban and Rural Development in monitoring, directing and controlling the two brunches of local authority. It is the minister who tells the local authorities what to do and what not to do. All initiatives, bye-laws, revenue-generation projects, and the hiring and firing of senior employees are at the mess of the minister, who must be consulted for approval. Sometimes, municipalities are directed by the minister to write of outstanding debts, like what happened in July 2013, (Zivanai et al., 2014). This exercise of writing off bad

debts creates problems in the long run. It strengthens the non-payment culture in the non-compliant residents. It also demotivates the compliant citizens, who may decide not to pay in future. Business people, instead of empowering their employees by giving them higher salaries to enhance payment to municipalities, they join the non-payment notion, after witnessing the non-compliant citizens being reinforced through the writing off exercise.

2.4. Incorrect Billing

Moyo (2016); Mudyanadzo and Nzwatu (2018); Zivanai et al. (2014) and Wozhele (2017), all note that incorrect billing affects revenue collection in municipalities. Most of the time municipality staff do not go round to take measurements of the quantity of water used but instead, use estimation to come up with their bills. In situations where water meters are defective, estimation is used to come up with the bills. To support this argument, Wozhele (2017) claims that at the time of the study, almost fifty percent of the water meters in Beit-bridge were out of order and estimation was the only option to come up with the bills. The researcher further notes that many residents were going for long periods without water, hence their water meters appear defective since there were no changes in readings. The Beit-bridge municipality used estimation for all such residents, and this created conflicts between the local authority and the citizens of the town.

2.5. Water Quantity

Supplying residents with water is one of the major services that municipalities are mandated to provide. Several researches have been carried out to show that Africans are able and willing to pay for the water that they consume. Whittington, Apia, Augustine, and Alexander (1990) discovered that in Nigeria, households were paying for water supplied by private vendors, amounts that are approximately equal to those paid in developed countries, for better services in both quantity and quality. A similar survey carried out in nine developing countries (Whittington & Choe, 1992) found that more than ten percent of the residents' income was spent on water provided by private vendors.

The amounts that people are paying to private vendors show that they are able and willing to pay. However, for people to pay similar amount for water supplied by municipalities, the quantity and quality of the water must be similar to that of private venders. Unfortunately, in African countries, water supplied by public service providers is of poor quality, (Whittington et al., 1990). As already mentioned, for similar amounts, in Africa, the quantity is much less than that supplied in industrialised countries.

2.6. Unwillingness

When a ratepayer has the ability to pay but does not pay, for whatever reason, that ratepayer is said to be unwilling to pay. Poor service delivery, deficient billing and the culture of non-payment are some of the reasons why residents may choose not to pay when they have the capacity to do so. Monthly bills that are erroneous are a potential source of the non-payment for capable residents, (Mazibuko, 2013).

2.7. Household Income

Public services demand is income elastic, (Linn, 1983). This means that, when there is only one type of supplier, private or public, low-income households will consume less water. In situations where both suppliers are available, low-income households will forgo quality and opt for public water, which is cheaper, though the quality is poor.

2.8. Amount Charged

The unit price of water has an effect on payment. If the unit price is high, consumers will be obliged to pay high amounts at the end of the day. When the amounts to be paid are high, there are high chances that the consumers will not be able to pay the total amounts charged. Low-income households may be forced to use less water when prices are high. High water charges dampen the demand and increase the availability of water but this disadvantages the poor.

3. STOCHASTIC PRODUCTION FRONTIER MODEL

A stochastic frontier model, Equation 1, defines a random upper bound of a response variable as a function of input variables plus an idiosyncratic random error, (Kumbhakar & Lovell, 2000).

$$Y_i = \alpha + \beta x_i + v_i \; where \; v_i \sim N(0, \sigma_v^2), for \; i = 1, 2, 3, \ldots \ldots \ldots N \quad (1)$$

The actual or observable output of a given production process, y_i, which is defined by equation 2, is obtained by subtracting a nonnegative random variable representing subject inefficiency, from the stochastic frontier.

$$y_i = \alpha + x_i\beta + v_i - u_i \text{ where } v_i \sim N(0, \sigma_v^2) \text{ and } u_i \sim N^+(0, \sigma_u^2), \text{for } i = 1, 2, 3, \ldots N \quad (2)$$

Equation 2 is the stochastic frontier model, as independently proposed by Meeusen and Van Den Broeck (1977) and Aigner, Lovell, and Schmidt (1977).

Since Equation 2 holds after subtracting the non-negative quantity u_i from the right-hand side of equation 1, it follows that the actual production level, y_i satisfies Equation 3.

$$y_i \leq \alpha + \beta x_i + v_i \text{ where } v_i \sim N(0, \sigma_v^2), \text{for } i = 1, 2, 3, \ldots \ldots \ldots N \quad (3)$$

The parts that make the right hand side of Equation 2 include the optimal $x_i\beta + v_i$, which is made up of $x_i\beta$, the deterministic and v_i, the stochastic part. As already mentioned, it is these two parts, together, that constitute the stochastic frontier. Here v_i and u_i are components of the error term of which v_i is a symmetric disturbance and v_i a non-negative error term associated with inefficiency. It is this definition of the error term that gives the SFA its great virtue. The variable y_i is the log of output of firm i and x_i 's are logs of inputs (after transformation from the Cobb-Douglas production function, $P = AK^{\alpha}L^{\beta}$). This approach distinguishes between inefficiency and white noise by assuming that inefficiency is persistent over time whereas random error sums up to zero with time, Eling and Lunen (2008). It is assumed that x, v and u are mutually independent. Aigner et al. (1977) assumed that inefficiency has a mean of zero suggesting that most of the firms are at the frontier where the inefficiency is zero, since inefficiency is one-sided. Meeusen and Van Den Broeck (1977), who, independently, founded the stochastic frontier model, considered not only the half-normal distribution for the inefficiency component of the error term. They also included the exponential distribution as a possible functional form of the inefficiency component.

The half-normal distribution of inefficiency with a mean of zero was seen by a number of researchers that include Meeusen and Van Den Broeck (1977), Aigner et al. (1977) and Stevenson (1980) as being too restrictive and limited, as there are situations where mean inefficiency is above zero. These researchers preferred the truncated-normal distribution to the half-normal distribution.

4. METHODOLOGY

The study employs the stochastic frontier modelling technique to estimate the efficiency levels of the residents of Chinhoyi town in paying for the services delivered by the municipality of Chinhoyi.

4.1. Data and Variables used in the Study

A questionnaire was designed as the data collection instrument. Chinhoyi has sixteen different residential suburbs. Ten households were randomly selected from each of the sixteen suburbs. The designed questionnaire was administered to the selected sample. The variables that were of interest in the research are shown in Table 1.

Table 1. Variables in the model.

X1	Water quantity	X2	Amount charged
X3	Incorrect billing	X4	Inability
X5	Unwillingness	X6	Household income
X7	Opportunism	X8	Dissatisfaction
Y	Amount paid		

Variable y was the dependent. The qualitative variables X3, X4, X5, X7 and X8 were measured on a Likert-scale, with the responses strongly disagree, disagree, sometimes, agree, and strongly agree. These responses were coded 1, 2, 3, 4 and 5 respectively, with 1 being the minimum and 5, the maximum. This means that as the phenomenon of interest gets stronger, the code takes a higher value. The variable X6, household income had its values categorized into five classes, $50000 or less, more than $50000 but less or equal to $100000, more than $100000 but less or equal to $150000, more than $150000 but less or equal to $200000, and more than $200000 Zimbabwean dollars. The codes were 1 to 5, in that order. For the quantitative variables, X1, X2 and the dependent variable Y were their natural logarithms. It is these logarithms that were used in the model. Equation 4 shows the frontier that was used here:

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \beta_3 x_{3i} + \beta_4 x_{4i} + \beta_5 x_{5i} + \beta_6 x_{6i} + \beta_7 x_{7i} + \beta_8 x_{8i} + v_i - u_i \qquad (4)$$

4.2. Parameter Estimation Method

The maximum likelihood method was used to estimate the parameters of the model. Equation 5 shows the likelihood function and the log-likelihood function:

$$L = \Pi_{i=1}^{N} f(\varepsilon_i), \text{where } \varepsilon_i) = v_{i)} - u_{i)}. \qquad (5)$$

The log-likelihood function for $\varepsilon_{i)} = y_i - m(x_i, \alpha)$ **is:**

$$L[\alpha, \mu, \sigma_s^2] = \ln L - \left(\frac{N}{2}\right)\ln 2\pi - \left(\frac{N}{2}\right)\ln \sigma_s^2 - \frac{1}{2}\sum_{i=1}^{N}\left(\frac{y_i - x'_i\alpha}{\sigma_s}\right)^2 + \sum_{i=1}^{N} \ln \Phi\left[\frac{(y_i - x'_i\alpha)\mu}{\sigma_s}\right] \qquad (6)$$

Where x'_i is an by 1 column vector.

The likelihood estimator of β, the vector of the coefficients is given by Equation 7:

$$\beta = \frac{\phi\left[\frac{(y_i - x'_i\alpha)\mu}{\sigma_s}\right]}{\Phi\left[\frac{(y_i - x'_i\alpha)\mu}{\sigma_s}\right]}. \qquad (7)$$

The conditional distribution of u given is:

$$f(u/\varepsilon) = \frac{\sigma_s\left[1-\phi\left(\frac{\lambda_*}{\sigma_{s_*}}\right)\right]^{-1}}{\sqrt{2\pi}\sigma_{s_*}} \exp\left\{-\frac{1}{2}\left(\frac{u+\lambda_*}{\sigma_{s_*}}\right)^2\right\} \quad (8)$$

$$\text{where } \lambda_* = \frac{\varepsilon\sigma_u{}^2}{\sigma_s{}^2} \text{ and } \sigma_{s_*} = {}^{\sigma_u\sigma_v}/_{\sigma_s}$$

To measure the technical efficiency, we use Equation 9:

$$TE_i = \exp[-E(u_i/\varepsilon_i)] \quad (9)$$

$$\text{Where} \qquad E(u_i/\varepsilon_i) = \sigma_{s_*}\left\{\frac{\phi\left(\frac{\varepsilon_i\mu}{\sigma_s}\right)}{1-\phi\left(\frac{\varepsilon_i\mu}{\sigma_s}\right)} + \frac{\varepsilon_i\mu}{\sigma_s}\right\}$$

5. RESULTS AND DISCUSSION

Equation 4 was run in Limdep 11 and the parameter estimates generated are shown in Table 2. From the table, the constant, X1 (Water quantity), X2 (Amount charged), X4 (inability), X6 (Household income) and X7 (opportunism) significantly affect the amount that consumers pay to the municipality for water supplied. This is shown by the stars (asterisk) on the estimates. Three asterisks on the estimate show that the estimate is significant at one percent and two asterisks show significance at five percent. X4 (inability), X5 (unwillingness), X7 (opportunism) and X8 (dissatisfaction) negatively affect the amount paid by consumers to municipality, while the rest of the factors had a positive effect on amount paid. The effect of unwillingness and that of dissatisfaction is, however, insignificant.

Table 2. Parameter estimates.

Variable	Coefficient	P-Value	Variable	Coefficient	P-Value
Constant	9.26205***	0.0000	X2	0.00372**	0.0126
X1	0.00163**	0.0346	X4	−0.00024**	0.0137
X3	0.28596D-04	0.7722	X6	0.00059***	0.0000
X5	−0.17081D-04	0.08903	X8	−0.00019	0.1611
X7	−0.00021**	0.0418			

Note: ** 5% and *** 1%

In addition to the coefficients shown in Table 2, the output also showed efficiency levels of the households. It was found that the most efficient payer had an efficiency level of 99.9641% while the least was at 99.9031%. The mean efficiency level was 99.9434%.

6. CONCLUDING REMARKS

The aim of this research was to establish the efficiency levels of Chinhoyi residents in paying for services offered by the municipality. The research found that the residents of Chinhoyi are highly compliant in paying for the services provided by the municipality. All the one hundred and sixty selected households had an efficiency level above 90%.

Water quantity, amount charged, inability, household-income and opportunism were found to be significantly affecting the efficiency of paying. Low efficiency levels were found to be due to either inability or opportunism, where consumers would stop paying with the expectation that the debts would be written off at some point. This means that those who give orders to the municipality to write off debts should refrain from doing that as it encourages non-payment by residents. It was also found that, although there is a significant linear relationship between the quantity of water used, that relationship is not perfect as situations were found in which a household that had used less water was charged more, for households in the same location.

Residents showed they were not happy with the amounts they were being charged by the municipality. They proposed that the municipality should reduce their charge per unit of water. Residents also proposed that if water supply is to be staggered, the supply should be once in two days instead of doing it for three consecutive days in a week like they are doing. For the water services to be commensurate with the payments they are making, consumers also suggest that water supply should be during the day and not during the night like is the case at present.

7. RECOMMENDATIONS

- Municipality revenue collection staff should have at least ordinary level that makes them competent in performing their duties.
- Residents should pay for the services delivered to avoid prosecution and other disturbances.
- Residents who trade informally should try and formalise their businesses through registering so that they assist in improving services through paying tax to the municipality.

- The municipality should enforce the law to ensure that non-compliant residents are brought to book.

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REFERENCES

Adenya, P. K., & Muturi, W. (2017). Factors affecting revenue collection efficiency by county governments in Kenya-A case of Kiambu county. *International Journal of Social Sciences and Information Technology*, *3*(8), 2371-2384.
Aigner, D., Lovell, C. K., & Schmidt, P. (1977). Formulation and estimation of stochastic frontier production function models. *Journal of Econometrics*, *6*(1), 21-37. https://doi.org/10.1016/0304-4076(77)90052-5
Asare, F. (2015). *Challenges of municipal finance in Ghana: A case study of Tema metropolitan assembly*. MPhil (Econ) Thesis, University of Ghana, Accra.
Boamah, N. A. (2013). Constraints on property rating in the Offinso South Municipality of Ghana. *Commonwealth Journal of Local Governance*, *13/14*, 77-89. https://doi.org/10.1108/pm-04-2013-0023
Botes, L. J. S., & Pelser, A. J. (2001). *Non-payment of municipal services: Base-line survey report*. Bloemfontein: Centre for Development Support, University of the Free State.
Chanyau, T. (2014). *Impact of revenue generating systems and performance in local authorities in Zimbabwe: A case of Chiredzi town council*. Hons (Acc) Thesis, Midlands State University, Gweru.
Cloete, J. J. N., & Thornhill, C. (2005). *South African municipal government and administration, the new dispensation*. Pretoria: Dotsquare Publishing.
Eling, M., & Lunen, M. (2008). *Frontier efciency methodologies to measure performance in the insurance industry: Overview and new empirical evidence*. Working Paper No. 86, University of St. Gallen.
Kucherera, G. (2014). *Revenue collection challenges in rural local authorities: A case of Kusile rural district council*. Hons (BSc. Loc Gov) Thesis, Midlands State University, Gweru.
Kumbhakar, S., & Lovell, K. (2000). *Stochastic frontier analysis*. Cambridge: Cambridge University Press.
Levi, M. (1997). *Consent, dissent, and patriotism*. Cambridge: Cambridge University Press.
Linn, J. F. (1983). *Cities in the developing world: Policies for their equitable and efficient growth*. New York: Oxford University Press.
Lita, W. (2013). *Evaluating reasons for non-payment of key services in Oshakati town*. Namibia Polytechnic of Namibia, Unpublished Thesis.
Mabika, H. (2015). Liquidity crisis and service delivery in Zimbabwe local authorities. *Journal of Political Sciences & Public Affairs*, *3*(3), 1-3. https://doi.org/10.4172/2332-0761.1000174
Mazibuko, G. (2013). *The impact of municipal billing on revenue collection in selected South African cities*. M (Pub Adm) Thesis, University of Pretoria, Pretoria.
Meeusen, W., & Van Den Broeck, J. (1977). Efficiency estimation from Cobb-Douglas production functions with composed error. *International Economic Review*, *18*(2), 435-444. https://doi.org/10.2307/2525757
Moyo, T. (2016). *Revenue decline in urban local authorities: A case study of Gweru city council*. BSc (Loc Gov) Thesis, Midlands State University, Gweru.
Mudyanadzo, W., & Nzwatu, M. (2018). Accounting for the decline of service delivery in urban local authorities: A survey of Zimbabwean cities and towns. *International Journal of Politics and Good Governance*, *9*(3), 1-26.
Mugumbate, J., Maushe, F., & Nyoni, C. (2013). Ruralisation of urban areas: Reversing development in Zimbabwe. *International Journal of Advanced Research in Management and Social Sciences*, *2*(7), 13-30.
Poperwi, L. (2018). *Making sense of poor service delivery in Harare City Council*. Zimbabwe Open University, Unpublished Thesis.
Scott, G. (2018). Influence of revenue mobilization practices on service delivery in decentralized governments: The case of district assemblies in Ghana. *Journal of Public Administration and Governance*, *8*(4), 215-238.
Stevenson, R. E. (1980). Likelihood functions for generalized stochastic frontier estimation. *Journal of Econometrics*, *13*(1), 57-66. https://doi.org/10.1016/0304-4076(80)90042-1
Tonhodzai, M., Nyikadzino, T., & Nhema, A. (2015). The utility of fiscal decentralization as a local governance reform strategy in Zimbabwe. *American International Journal of Social Science*, *4*(5), 69-79.
Whittington, D., Apia, O., Augustine, O., & Alexander, M. (1990). *Cost recovery strategy for rural water delivery in Nigeria*. Policy, Research and External Affairs Working Paper WPS No. 369. Washington, DC. World Bank.
Whittington, D., & Choe, K. (1992). *The economic benefits available from the provision of improved portable water supplies: A review and assessment of the existing evidence, water and sanitation for health technical project*. Arlington, VA: USAID.
Wozhele, V. (2017). *An assessment of the effectiveness of revenue collection strategies employed by local authorities: A case of Beitbridge town council from the period 2010– 2017*. Hons (Pol Pub Mng) Thesis, Midlands State University, Gweru.
Zhou, G., & Chilunjika, A. (2013). The challenges of self-financing in local authorities the case of Zimbabwe. *International Journal of Humanities and Social Science*, *3*(11), 233-245.
Zivanai, O., Manyani, O., Hove, N., Mabhungu, I., & Muza, R. (2014). An assessment of revenue collection constraints in Zimbabwean local authorities: A case study of Bindura municipality (2009-2013). *International Journal of Innovative Research and Development*, *3*(9), 24-33.