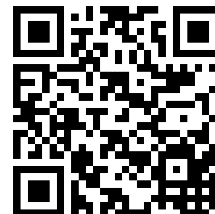


An Analysis of Contributory Factors to Low Own Sources Revenue (OSR) in Local Authorities in Zambia: A Case Study of Muchinga Province



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ABSTRACT: The study aimed at analysing contributory factors to Low Own Sources Revenue (OSR) in Local Authorities (LAs) in Zambia case studying Muchinga Province. The study was guided by three objectives which were: to review the existing legislation that supports the Local Authorities to collect their own source revenue; to assess the Local Authorities' revenue collection methods and their efficacy, and to design a model to be used to improve the Local Authorities' own source revenue in Muchinga Province and other regions. The study used primary data which was obtained by means of individualized questionnaires and in-depth interviews. Using the Survey Monk formula, the targeted population was 1,000 of the local authority employees, civic leaders, and local business owners of small and medium-sized enterprises (SMEs) that pay taxes to the local authorities in their respective districts from which the sample size of 300 was obtained. The response rate was 66%. Random and purposive sampling techniques were used. The findings of the study revealed that the legislative frameworks, measures, and remedies were not sufficient in enhancing revenue collection by local authorities and that these local authorities largely dependent on the legislative framework, measures and remedies in revenue generation. The findings further showed that there was a belief among the respondents and interviewees that the revenue collection strategies were inappropriate for the local authorities. The interviewees also stated that the manner or method of assessing revenue collection was not effective at all as the local authorities mainly assessed the existing revenue collection's efficacy through open meeting with the extent of revenue generation strategies and mobilization model being perceived to be poor. The results of the study clearly showed that local authorities are not effective in their collection of revenue and as such there is need for the local authorities to review existing legislation, methods of revenue mobilization and design a model that can enhance revenue collection in their Jurisdiction. Therefore, the study strongly recommended that the legal framework supporting revenue collection needed to be harmonized or reviewed to allow the Local Authority to exercise its full potential in OSR. The study further recommended that local authorities be computerized in all its revenue sources to minimize red tapeism, revenue pilferages / leakages, and corruption in revenue collections and accounting. The study further recommended the adoption of the internationally accepted Tax Administration Diagnostic Assessment Tool (TADAT) framework for Tax and Non-Tax Revenue Administration which should be the starting point, which focuses on nine key performance outcome areas that cover most revenue generation, administration functions, and processes. These areas include integrity of the registered revenue data base, effective risk management, supporting voluntary compliance, timely filing, timely payment, accurate reporting, effective dispute resolution, efficient revenue management, and accountability and transparency.

KEYWORDS: Revenue Collection Methods, Own Sources Revenue, Local Authority, Muchinga Province, Zambia.

1. INTRODUCTORY BACKGROUND

Local authorities form a segment of government tasked with the delivery of municipal services to local communities as they are politically and socially closest to the people and play an important role in sustainable socio-economic development of nations. Therefore, local authorities are supposed to be efficient and effective in in-service delivery to remain politically and socio-economically relevant alleviating poverty of the masses in their respective jurisdictions.

According to Considine and Reidy (2015) sustainable municipal service delivery requires sufficient financing this means local authorities need to generate adequate revenues to meet the sort of expenditure in the execution of their mandate "small-sized" local authorities do not have an adequate revenue base to raise and collect enough finances internally. On the other hand, the

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“larger-sized” local authorities who have sufficient revenue base to locally raise and collect adequate revenues are plagued with negative factors such as political interference, unwillingness by local taxpayer for a troubled service delivery system, corruption, and management failures to come up with revenue optimizing strategies (Zhou and Chilunjika 2013; Piña and Avellaneda 2017). Despite the many comprehensive Central Government tax reforms during the last decade, local authorities' revenue systems in sub-Saharan Africa have remained largely unchanged. Generally, a fundamental requirement when redesigning local revenue systems is a greater emphasis on the cost-effectiveness of revenue collection, considering not only the direct costs of revenue administration but also the overall costs to the economy, including the compliance costs to taxpayers. For instance, the study done by Murana (2015) shows that due to the local authority's lack of financial autonomy, no infrastructure project is undertaken in a local authority without central government involvement. Central government transfers ensure that the councils implement infrastructure projects as decided by internal local politics or central government guidelines (Piña and Avellaneda 2017). This in turn means that local authorities' performance is influenced by local and national political influences over central government fiscal transfers (Lentner 2014). However, though there is this system of central government transfers in place local authorities continue to struggle financially (Uryszek 2013).

According to Makasa and Hapompwe (2024), for local authorities to effectively finance their operations and provide services to the community, they collect revenue through taxes, personal levies, fees, rentals, charges, among others. Furthermore, it is worth noting that in addition to political, social, and financial conditions affecting the local authorities' performance and effectiveness in the discharge of duties and responsibilities to the communities, the sound financial position of local authorities was neutralized by Zambian government's decision to transfer almost all flourishing sources of income from councils through the enactment of statutory instrument number 55 of 2000 and the Water and Sanitation Act no.28 of 1997 to utility councils thus collection of income tax, sales tax, road tax, water and electricity charges were no longer under the jurisdiction of local authorities. These could be some of the militating factors against the country's socio-economic development in spite of its being among the richest countries globally in terms of natural resource endowments, yet very de-industrialized and underdeveloped (Hapompwe, Banda, and Chalwe, 2024).

The Zambia Intergovernmental Fiscal Architecture (2017) gives a great overview of the background of OSRs in local authorities, worth repeating here in full. It states “Local Own Source Revenues (OSR) have in the past been low and have systematically deteriorated over time as the Central Government (CG) has often intervened on levies, exemptions, and rate levels. Revenue sources, such as the crop levy were removed, exemptions granted, and tax rates curtailed, thereby affecting OSR administration and dramatically reducing the ability of local governments to mobilize their own revenue. In most cases, property valuation rolls have been out-of-date, incomplete, cumbersome, and expensive reducing the local authorities' ability to mobilize property rates. At the same time, local authority administrations have been relaxed, often without the needed capacity nor backed by adequate local political will to improve the equity, efficiency, and revenue collection from the available local revenue instruments. Taxpayers have also been relaxed in paying their obligations due to lack of awareness, information, and/or incentives for voluntary compliance.” According to Cabinet Office, (2017, pp. 2-3) the major revenue sources for councils in Zambia apart from the intergovernmental transfers, are rates (property tax), Levies (taxes on local, usually, business activities), Use Charges, Personal Levy (a Local tax on personal income) and Licenses (business permits). The relative significance of these sources is somewhat different between the different types of local authorities.

Muchinga Province is one of the 10 provinces in Zambia. The province was created in 2011 after detaching it from its mother province Northern Province. The province is named after Muchinga Escarpment on which the province predominantly sits. Muchinga Province is in the northeast of Zambia. The province covers a surface area of about 87,806 squares kilometers, sharing its borders with Luapula Province in the west, Northern Province in the northwest, Eastern Province in the east and Central Province in the southwest. It also shares international boundaries with Tanzania in the north and Malawi in the east. The province is headed by a Provincial Minister appointed by the President, as the political head of the province. The administrative head of the province is the Permanent Secretary, who is also appointed by the President. Muchinga Province is divided into eight districts, namely, Chinsali district, Isoka district, Mafingadistrict, Mpika district, Nakonde district, Shiwang'andu district, Lavushimanda district and Kanchibiya district. Chinsali is the capital of the province, serving as an administrative center of the province. According to the Zambia Statistical Agency (2022), the province had a population of about 918,296total population. Predominantly, the economy of Muchinga Province is based on subsistence farming and trading. The eight local authorities need resources to finance the services and activities for which they are responsible. The relative significance of these own sources of revenue is somewhat different between the different types of local authorities. While it is obligatory on the part of the central government to make transfers to the local authorities, such transfers do not come when most needed and are not sufficient to meet the needs of all the 116 local authorities in Zambia.

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1.1. Problem Statement

According to Chikulo, (2014), "Since the early 2000s, the Government of the Republic of Zambia (GRZ) has pushed forward a decentralization agenda aimed at promoting community participation, quality service delivery and accountability. As part of this initiative, the government mandated local authorities to manage the delivery of services and undertake "developmental activities in such areas as health, water and sanitation, education, housing, roads, environment, agricultural extension work for food security, etc.". However, the failure of most local authorities to utilize their potential at the optimum level has resulted in their failure to provide the much-needed services to the citizens within their jurisdictions. Using the records maintained by the Provincial Local Government Officer in Muchinga Province for the financial year ended 31st December 2023, the eight local authorities budgeted to locally generate funds from various sources in amounts totaling ZMW 163,703,236.70 against which amounts totaling ZMW 68,154,494.84 as actual generated resulting in a negative variance of 58% while for 2022 budgeted amount was ZMW 63,727,636.96 against a total amount generated of ZMW 48,819,947.10 resulting a negative variance of 22%. The potential to generate more own source revenue is very clear as evidenced by the budget estimates. It is also evident that there is a dire need for the local authorities to relook at strategies to enhance their revenue collection, existing legislation, revenue collection methods and the model used by local authorities in revenue generation, especially on charges, local taxes, licenses and other incomes where very little amounts were being collected.

Research done by Abdullahi and Kwanga (2012) found that grants alone are not sufficient to sustain local needs in local authorities seven though grants are an important aspect of intergovernmental relations. Development at the grassroots has been circumvented mainly due to underlying factors like over-dependence on central government grants and corruption. Despite the province having some of the oldest local authorities in Zambia, there was little to no understanding of contributory factors to low own sources of revenue in local authorities, hence the commissioning of this study to analyse contributory factors to low own sources of revenue in local authorities in an attempt to bridge the notable gap(s).

1.2. Study Objectives

- 1.2.1. To review the existing legislation that supports the Local Authorities' collection of their own source revenue in Muchinga Province.
- 1.2.2. To assess the Local Authorities' revenue collection methods and their efficacy in Muchinga Province.
- 1.2.3. To design a model to be used to improve the Local Authorities' own source revenue in Muchinga Province.

2. LITERATURE REVIEW

2.1. Existing Legislation Supporting the Local Authorities to Collect their Own Source Revenue.

Shun (2016) conducted a study on Central and Local Government Finance in Japan. The study aimed at analyzing how Japan's municipalities restore their fiscal balance after a fiscal shock. The study revealed that there was a large vertical fiscal gap in Japan between the central and local governments. This gap necessitated the transfer of funds from central to local governments. The study revealed that fiscal adjustments in Japan's municipalities occurred mainly via changes in government investment. In contrast to the role of expenditure, the municipalities' own-source revenue played a limited role in balancing the local budget. The results of this study also revealed that 40% of the increase in own-source revenue was offset by a reduction in grants. The study further revealed that municipalities induced grants by expanding government expenditure. The study by Shun (2016) is relevant in that it provides information on how local authorities can restore their fiscal balance after a fiscal shock. However, the study does provide a lot of information on the causes of fiscal imbalance in local authorities.

Musleh (2016) conducted a study on Local government decentralization efforts for revenue mobilization in Bangladeshi. The study revealed that there has been poor local revenue mobilization by local authorities in Bangladeshi due to lack of proper commitment towards decentralization of authority by central government. The study also revealed that revenue collection performance is not impressive mainly due to centralized tax structure, narrow tax bases and higher tiers access to rural local fiscal domain. The study further revealed that all rural areas in Bangladeshi are not identical. The variations, challenges and opportunities have an impact on local revenue collection and resource mobilization. Musleh's (2016) study teaches us that narrow tax bases negatively affect local revenue mobilization. The limitation of Musleh's (2016) study is that it only reveals the negative effect of a narrow tax base on local revenue collection, but it does clearly reveal the effects of centralized structures on local authority revenue mobilization. A study by Resultist Consulting (2021) suggests that the proper revenue strategy aligns revenue collection, and client experience teams around a singular goal: good or optimum service provision and enhanced revenue collection could be achieved. Without a strategic roadmap, healthy and sustained growth simply cannot flourish, which is why organizations put so much emphasis on the

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planning process. The right strategy would ensure you achieve your revenue and profit goals. It would be a foundation for selecting and developing the right team, the right software, and tools, developing effective processes, remarkable products, and services. In the study by Tembo and Mwanaumo (2022), it was established that local authorities are cognizant of the fact that generating adequate own revenues can help break the continuation of the dependence and dominant relationship with the central government. Unfortunately, local authorities are unable to generate their revenues since the national government has taken up most revenue streams in the districts and put in place regulations that restrict the generation and collection of their revenues. The research also established that other major constraints to internal revenue generation included continued delay in releasing decentralized functions by the central government, lack of political will from the central government, failure to implement the agreed decentralized structure by the central government, failure to relinquish some revenue streams to local authorities, governments have unclear policy guidance on decentralization and lack of a standardized system as well as a monitoring mechanism. The results of this study suggest the irrefutable need to review the implementation of decentralization and promptly address all the impeding factors to decentralization to empower and reposition local authorities in the governance system. This study shows that empowering and developing capacities of local authorities require endless political will more than disbursements of grants on the part of the national government. Research results showed that there is a need for reviewing the existing revenue streams to include other key sectors in each district to achieve the main objectives of empowering and enhancing local authority autonomy through decentralization.

2.2. Local Authorities' Revenue Collection Methods and their Efficacy.

Turley and McNena (2019) outlined various revenue issues faced by local governments in Ireland, including fiscal autonomy and income differences between urban and rural councils, which reflect the diverse challenges, including corruption and fraud, faced by Lusaka City Council. Madhovi (2020) emphasized the positive impact of implementing social accountability tools on fiscal management challenges faced by local governments. This suggests potential solutions for challenges like corruption and limited enforcement faced by local authorities in Muchinga Province, Zambia.

In the study by Makasa and Hapompwe (2024), it was noted that in performing its functions, Lukulu town council, like any other local authority country-wide, had faced numerous constraints due to the imbalances in budget expenditures and revenue base. The duo's study, however, focused on factors affecting employee performance in local authorities, and not contributory factors to low own source revenue, which was the focus of this study. It should, however, be underscored that there are human resource issues internally which affect the efficient and effective collection of revenue by these local authorities as established by Makasa and Hapompwe's study.

In 2021, research was also conducted in Tegal City, which aimed to analyze the optimization of local tax revenue in Tegal City, Indonesia, using ratio analysis and Klassen typology mapping. This research highlights the lack of thorough research on the ability of local governments in Indonesia to increase overall tax revenue, focusing on efforts to overcome limitations and provide solutions for local governments to increase local tax revenue (Arintoko & Bawono, 2021).

In 2018, in South Sulawesi, precisely in the new regency, similar research was also conducted to explain and examine the performance of the Regional Revenue Agency in managing regional taxes, as well as analyze the factors that contribute to the non-achievement and excess targets in the management of regional taxes in Barru Regency. The number of other activities and the lack of human resources are obstacles in the process of managing local taxes (Bahnar & Kadir, 2018).

In 2020, research was also conducted in Boyolali Regency, which aimed to assess the contribution of local tax components and local levies to Boyolali Regency's original revenue (PAD), identify local tax components and local levies that have significant potential for PAD, and analyze their impact on economic growth in Boyolali Regency (Karananingtyas, 2020). Although their search was conducted in Boyolali Regency in 2015, research with other methods, new data, and new theories are still needed to find out the latest conditions in Boyolali Regency.

The assessment of challenges in revenue management by local authorities in Zambia revealed major issues such as Political Influence, Limited Enforcement, Corruption & Fraud, and Administrative Inefficiencies. These challenges are not unique to Lusaka and resonate with findings from various studies on local government revenue management worldwide: Takwa, Babila, and Teno (2020) identified challenges in revenue generation for local councils, including central government infringement on internal revenue generation and lack of power to make finance laws, which can be related to the political influence and limited enforcement issues faced by Lusaka City Council. Sharma (2021) discussed the challenges local authorities in developing countries face in managing fiscal imbalances due to rapid urban population growth and dependency on central government transfers. This aligns with the fiscal management challenges, including administrative inefficiencies, experienced by the Lusaka City Council.

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Kuusaana (2015) highlighted major hurdles in property rating in Ghana, such as poor property data systems, political interference, and insufficient staffing, which are like the challenges in revenue collection methods like Property Rates in Lusaka.

Mbewe (2019) conducted a study on fiscal decentralization in Zambia's local councils with particular focus on Lusaka City Council (LCC). The study revealed that Lusaka City Council (LCC) collects less revenue in relation to the cost of increasing services within its jurisdiction. The study also revealed that deficiency in service delivery is further exacerbated by the fact that the local authority misapplies the little it has by spending almost 60 percent of its resources on non-service responsibilities such as, administrative/operational and other employee related costs and less than 40 percent on service provision. The study further revealed financial administration at LCC, is characterized by considerable levels of transparency and accountability. Rules and procedures are adhered to about the administration of finances, with the council being answerable to various stakeholders about matters of financial nature. This would make clients better customers for the council, prudent managers of the limited financial resources in their businesses and better able to select the most suitable products for their businesses (Siwale et al, 2021). The study by Mbewe (2019) is important to this study in that it provides useful information on the extent to which Lusaka City Council is autonomous from central government control. However, the findings of the study only targeted a city council and left out municipal and town councils.

Additionally, the study assessed whether there is a relationship between factors influencing revenue management and effective revenue collection strategy at Lusaka City Council. It found that Bank Deposits are perceived as the most effective and efficient method. The use of improved data management, automation, and technology, and the emphasis on enforcement and compliance are seen as effective strategies to reduce revenue loss. The regression analysis showed a statistically significant relationship between various factors (Internal Factors, Methods of Revenue Collection, External Factors, etc.) and the dependent variable (Source of Funds). This finding is in line with, Otieno et al. (2013) found that information systems have a strong positive relationship with revenue collection in Kenyan Local Authorities, emphasizing the importance of technological integration in revenue management systems. Okidi, Akello, and Opio (2021) demonstrated that control activities significantly affect revenue collection in local governments, highlighting the importance of internal factors in influencing revenue management efficiency.

The study did not provide a comprehensive analysis of local authority's revenue collection and management and the importance of various revenue streams and the adoption of efficient collection methods like Bank Deposits and setting up various collection points like Zambia Revenue Authority (ZRA) but rather underscores the challenges such as political influence, corruption, and administrative inefficiencies, common within local governments, especially in Africa. The need for strategic adaptation to improve financial stability and operational efficiency is emphasized. Key strategies include leveraging technology, enhancing enforcement, and ensuring internal and external factors like compliance and economic conditions are managed effectively. This study's insights are valuable for policy-making and strategic planning, offering a blueprint for enhancing revenue systems in similar contexts globally.

2.3. Models used to improve the Local Authorities' Own Source Revenue.

Local revenue mobilization in African local government authorities is deemed crucial by Fjeldstad & Heggstad (2012). However, it is often insufficient to meet the demands of the rapidly growing population. This emphasizes the need for innovative strategies to boost local revenue streams and enhance service delivery. The challenges in revenue management across different countries are underscored by various studies (Shanty et al., 2020; Alcantara et al., 2018; Teremetskyi et al., 2021; Franzsen, 2014; Hapompwe et al., 2020). These challenges, ranging from inadequate financial management to corruption, misapplication, misappropriation, and technological limitations, necessitating policy reforms, staff training, and technological investments as recommended solutions. In Nigeria, poor revenue generation by local governments has implications for the overall development of the country, as highlighted by Agbe, Terzungwe, & Igbabee (2017). Effective measures are deemed necessary to generate revenue for local development, emphasizing the crucial link between revenue generation and broader development goals.

Vazquez (2014) conducted a study on mobilizing financial resources for public service delivery and urban development in Islamabad. The study aimed at providing an overview of both conventional and new sources of local government financing. The study revealed that to effectively address the challenge of mobilizing adequate financial resources, urban authorities in developing countries should consider using mechanisms such as municipal bonds, bank loans, municipal development funds, funds from institutional investors, corporate bonds, equity markets and public-private partnerships (PPP). The study also revealed that borrowing from capital markets was an alternative way to mobilize financial resources for municipalities though borrowing required a demonstration that councils were creditworthy.

Mushimbwa (2020) conducted a study on examination of strategies of local revenue collection in local government authorities in Zambia focusing on Gwembe District Council. The study revealed that the current strategies are for Gwembe District councils are

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not yielding the expected results in local revenue collection as the LA was struggling to collect as much revenue from own sources making them dependent on Central Government funding to meet their obligations. The study further revealed that the inability to mobilize sufficient local revenue by local authorities can be seen merely as a symptom of more deep-seated socioeconomic and institutional constraints. Mushimbwa's (2020) study is important to this study in that it reveals important information on the revenue collection strategies of Gwembe District councils. However, Mushimbwa's (2020) study focused only on a District council and did not examine city and Municipal councils.

Chilufya (2010) conducted a study on Assessment of sources of revenue for local authorities in Zambia focusing on Copperbelt-based local authorities. The study aimed at investigating as to whether local authorities had put in place strategies that can broaden their sources of income. The study revealed that local authorities did not have strategic plans to provide as a guide as to where they are supposed to be in the next five years. The study also revealed that local authorities have not put in place adequate investment interventions to make their sources of revenue sustainable. The study further revealed that local authorities have not exploited their potential to make their income sustainable. The study even revealed that the inadequacies of modern technology such as computers and necessary software packages hindered efficient revenue mobilization. The study by Chilufya is important to this study in that it provides useful information on some of the strategic plans which local authorities design to broaden their sources of revenue. However, the shortfall of Chilufya's (2010) study is that it did not provide information on to what degree the sources of income match with the existing capabilities and values.

2.4. Gaps in the Literature

Local Authority self-sufficiency entails ability to internally generate revenue and ensure efficient, effective and sustainable expenditure in municipal services' delivery. Local authority's ability to satisfy their communities is thus directly related to their financial autonomy. It is clear from the surveyed literature that a number of studies have been conducted related to municipalities and councils' revenue collection from local to global frontline. However, the studies have not adequately and directly considered the legislation, collection methods, and efficacious strategies that can necessitate effective collection of own source revenue by local authorities especially from the jurisdiction under review.

2.5. Theoretical Framework

This study was guided by two (2) fundamental theories relevant to the study focus. These being: The Revenue Enhanced Model and Local Government Finance Model.

2.5.1. The Revenue Enhanced Model

The Revenue Enhanced Model developed by the USAID in 2006 as a guide to municipalities toward increased revenue for local governments, also serves as the study's theoretical foundation. The model suggests that the provision of metered services, accurate billing, (i) effective and efficient debt management, (ii) accurate billing, and (iii) metered service provision can increase and sustain revenue for local governments. The lack of political will, skills and competence, inadequate and erroneous legislation, and a lack of integration and coordination within local authorities are some factors that affect successful revenue collection, according to USAID (2006) improved for residents to start paying bills.

2.5.2. Local Government Finance Model

The other model forming the theoretical framework for this study is the Local Government Finance Model developed by the Institute for Fiscal Studies (IFS), in partnership with the Chartered Institute of Public Finance and Accountancy (CIPFA) (Rivenbark, Roenigk & Allison, 2010). Thus, the model is also known as the IFS-CIPFA Local Government Finance model (Phillips, 2023). The local government finance model is a crucial aspect of governance that determine how local authorities generate revenue to fund essential services and infrastructure development. This model varies across different countries, but its primary objective remains consistent: to ensure the financial sustainability of local governments. An important aspect of the local government finance model is fiscal decentralization (Phillips, 2023). This involves granting greater autonomy to local authorities in managing their finances and making decisions regarding expenditure priorities (Rivenbark et al., 2010). As stated by Rivenbark et al. (2010), fiscal decentralization promotes accountability and responsiveness by allowing communities to have a say in how their tax dollars are spent. In this study, the model aided in guiding the development of the conceptual framework as well as the model for locally generated revenue and service delivery in the Muchinga Province in Zambia.

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2.6. Conceptual Framework

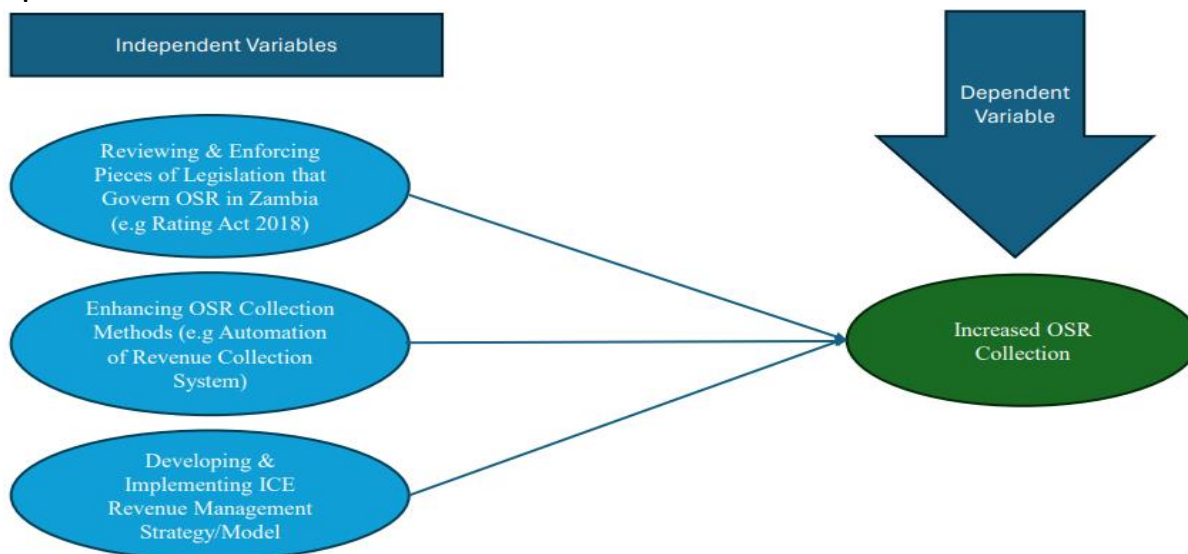


Figure 1 Study's Conceptual Framework
Source: Researchers Design (2024)

As shown in **Figure 1** above, this study is guided by three variables aligned to the study objectives: legislation, collection methods, and effective model for OSR. This is also consistent with the tenets of the Revenue Enhanced Model developed by the USAID in 2006, the Local Government Finance Model developed by the Institute for Fiscal Studies (IFS), in partnership with the Chartered Institute of Public Finance and Accountancy (CIPFA) (Rivenbark, Roenigk & Allison, 2010). and Erika (2003) defines a conceptual framework as a network of interrelationships that is logically developed among variables that are believed to be the fundamental part of the dynamics of the case being investigated. The framework suggests that improvement of the pieces of legislation that govern own sources revenue, revenue system automation i.e. accurate billing and online payments, and development and implementation of information, education and communication strategy for tax payers can increase and sustain revenue for local authorities and enhanced service delivery.

3. METHODOLOGY

In terms of research approach, this study, was guided by a case study design. The researchers used the case study design because according to Yin (2013), this approach is appropriate for developing recommendations as it involves subjective analysis of participants. Madu (2016) determined that case study design is ideal for exploring the views of participants. It specifically enables the researcher to obtain an accurate representation of views on the effectiveness of revenue collection by local authorities in Zambia. Credible information can also be collected timeously at a relatively low cost as compared to other research designs. The study was conducted in local authorities in Muchinga Province located in Zambia. The targeted population were the 1,000 the local authority employees, the civic leaders, and local business owners of small and medium-sized enterprises (SMEs) that pay taxes to the local authorities in their respective districts from which the sample size of 300 was obtained. The turnout response was at 66%. Purposive and simple random sampling were used as techniques. The study used both questionnaires and interview schedules. SPSS version 25 was used to analyse quantitative data while content analysis was applied on qualitative data. Ethical consideration and measure of data quality control were adhered to with deserved strictness.

4. FINDINGS

4.1. Existing Legislation Supporting the Local Authorities to Collect their Own Source Revenue.

The finding from the study was that 60% of the respondents stated that they were unaware of the existing legislation that govern own source revenue collection in Zambia while 40% were aware. Furthermore, 55% of the study respondents believe that the existing legislation is ineffective in supporting the local authorities to collect their OSR with the following distribution: 40% very ineffective, 10% effective, 5% very effective and 15% neutral response.

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4.2. The Local Authorities' Revenue Collection Methods and their Efficacy.

The findings were that 50% of the respondents stated inconsistent payment from the taxpayers was a major challenge Local Authorities face in the revenue collection process, 29% was due to poor infrastructure, 15% was due to lack of skilled personnel and 6% other factors. Furthermore, 45% of the study respondents believe that there is lack of clarity in the law which hinder the collection of own source revenue by Local Authorities, 35% inadequate support from the central government, 15% insufficient enforcement mechanisms and 5% was attributed to other factors.

Table 1: OSR Actual Against Budgeted FY 2022/2023

No.	Name of LA	FY 2022 Approved Budget OSR	FY 2022 OSR Actual Collection	OSR as percentage of Total	FY 2023 Approved Budget OSR	FY 2023 OSR Actual Collection	OSR as percentage of Total Revenue	Percentage Change in OSR
1	Mpika	14,628,867.00	7,539,666.00	52	26,476,316.70	12,629,233.80	48	-4
2	Shiwangandu	3,674,273.00	848,788.00	23	12,208,010.00	1,253,277.00	10	-13
3	Isoka	6,753,604.00	4,228,605.43	63	17,613,338.00	3,877,344.46	22	-41
4	Lavushimanda	1,920,942.12	1,444,771.48	75	10,695,311.00	1,421,580.18	13	-62
5	Chinsali	6,205,485.00	5,562,873.00	90	30,238,885.00	7,325,514.00	24	-65
6	Mafinga	1,076,830.00	622,144.91	58	17,687,246.00	1,490,940.00	8	-49
7	Kanchibiya	1,822,137.00	645,709.78	35	11,501,375.00	4,418,308.00	38	3
8	Nakonde	27,645,498.84	27,927,388.50	101	37,282,755.00	35,738,297.40	96	-5
	Total	63,727,636.96	48,819,947.10	77	163,703,236.70	68,154,494.84	42	-35

Source: Feld Data MLGRD (2024)

The table above shows the comparison of the own source revenue collection (locally generated revenue) against the approved budgeted amount for eight Local Authorities in Muchinga Province for the financial year end 2022 and 2023. Kanchibiya Town Council with the highest recorded at 101% collection efficiency for the financial year end 2022 and Mafinga Town Council recorded the lowest with 8% collection efficiency for the financial year end 2023. The collection efficiency of revenue is a measure of the effectiveness of collection methods used. This level of collection, assuming the planned revenue was correct, show a somewhat mildly ineffective to ineffective collection regimes collection methods include manual revenue collection using a physical receipt book in some local authorities those receipts go missing.

In practice, bills for rates are sent out twice a year, January for the first half and July for the second half, even if the law does not specifically have provisions to that effect while fees and charges are charged on services rendered, and normally paid upfront, collection efficiency is more a measure of the accuracy in forecasting what the demand for the services to be rendered might be, Levies are collected as specific business activities are undertaken, at points at which the business is undertaken, collection should be a relatively simple affair. However, as these transactions happen in the field, in some places, such as collection of a levy, like grain levy, quite remote from council offices, the possibility of fraudulent activities are high. Due to the high prevalence of cell phone use and cell phone talk time vendors, possibilities of introducing mobile device-based payment systems may reduce the risk of LAs being defrauded.

4.3. Model used to improve the Local Authorities' Own Source Revenue.

The findings were that 45% of the study respondents would support the implementation of a new model to improve revenue collection, 20% don't think so while 35% maybe. Besides, 48% of the study respondents believe it's very feasible to implement a new revenue collection model in your Local Authority, 35% feasible, 13% thinks it's very difficult, 4% difficult and 0% Neutral.

The findings were that to enhance own source revenue mobilization involves the implementation of various strategies that make it easier for the Local Authorities to collect revenue, such as revenue collection and management, updating billable revenue databases, and revenue forecasting, among others. The study revealed various capacity gaps in developing a revenue generation model, ability to collect, account, and manage these financial resources for improved service delivery. Adopting the internationally accepted Tax Administration Diagnostic Assessment Tool (TADAT) framework for Tax and Non-Tax Revenue Administration is the starting point. It focuses on nine key performance outcome areas that cover most revenue generation, administration functions and processes. These include integrity of the registered revenue data base, effective risk management, supporting voluntary

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compliance, timely filing, timely payment, accurate reporting, effective dispute resolution, efficient revenue management and accountability and transparency. Further, an equity method i.e. “cow horn” is deemed feasible in which all possible and potential tax payers were provided with municipality services equitably for a broadened revenue base.

The interviews conducted on the thematic areas did not show any fundamental digressions from the questionnaire respondents, which demonstrated that the challenges or phenomena were collectively perceived and shared.

“I recommend the development of a ‘cow horn formation method’ i.e. holistic model in collecting revenue to sustain councils’ operational expenses without depending heavily on central government for financial aid by applying **equity** in service provision to urban, peri-urban and rural dwellers in order to boost the willingness of all in paying for all applicable fees, levies, permits and charges” some interviews would say.

5. DISCUSSION OF FINDINGS

5.1. Existing Legislation Supporting the Local Authorities to Collect their Own Source Revenue

Regulation and legal framework empower, guide, limit and affect local authorities. There are several laws that administrate the local government tier in Zambia. The research found that these laws have come short of creating an enabling environment for local authorities to become autonomous because they have created barriers to collection of internally generated revenues that are crucial for their growth and sustainability. The study findings are that there are national government regulations that are in place to hinder the collection of internal revenues in local authorities. These regulations have caused local authorities to have reduced revenue bases and further impede council’s innovation to develop alternative revenue sources despite clause 152 (2) of the Constitution of Zambia (Amendment) No. 2 (2016) stating that “the national Government and the provincial administration shall not interfere with or compromise a local authority’s ability or right to perform its functions”. Section 69 (1) of the Local Government Act provides that a council may make by-laws imposing levies on: “(a) a levy on leviable persons owning or occupying property or premises situated within the area of the council; (b) a levy on leviable persons carrying on a business, trade or occupation within the area of the council; (c) a levy on the purchase or sale of a commodity within the area of the council.” To date, the major levies charged by local authorities relate to item (b). An extract of the section is included as Appendix 7. However, section 82 of the Act provides that 82. (1) No by-law made by a council under this Act shall have the force of law until it has been confirmed by the Minister”. This provision in section 82 seems somewhat at loggerheads with the national intent of decentralization and has been used in the past to cancel all levies, to the detriment of local authorities.

The World over, owners’ rates have been recognised as one of the biggest sources of Local Authorities’ revenue used for delivery of municipal services. However, in Zambia, Owners’ Rates or Property Rates have not effectively provided revenues to Local Authorities that have substantial property numbers and values within their jurisdiction. This has mainly been due to various reasons that have contributed to the failure of Rating Authorities deriving the best returns on their potential to collect property rates/Owners’ Rates. Reforms that should quicken the valuation process and get the best out of owners’ rates. Successful improvement of property rates performance depends on reform at two levels: first, at the macro level and revisiting the legal framework and overall organization of the system and, second, at the micro and operational level where the details of effective administrative processes are put in place and strengthened. Meaningful improvements could be achieved through micro and operational reform. But unlocking the full potential of the property rates system will require broader reform. Fatile and Ejalonibu (2015) in their quest for quality service delivery in Nigeria identify, among others, lack of considerable degree of local authority autonomy as one of the biggest challenges facing Nigeria’s implementation of decentralization and making quality local service delivery difficult to realize.

Chuangchit (2015) studied fiscal sustainability in Thai local authorities and concluded that Thai local government needed to diversify their revenue sources to ensure adequate funding for public service delivery. Similarly, this study established that there is need for local authorities in Zambia to generate their own revenue because grants are not sufficient to address all local authorities’ interests. However, local authorities are unable to generate own revenues since the national government has taken up most revenue streams in the districts. In the same manner, there are central government regulations as well as undue political interference that restrict local authorities to collect several fees. Cox (2010) argue that some local government regulations were not meant to help local authorities exercise greater financial freedom rather are designed to constrain the local autonomy and perpetuate the effect of making councils more dependent on central grants. Such regulations limited local revenues to a few unpopular taxes or fees that are problematic and expensive to collect, inequitable in impact and economically distorting (Devas 2005). Local authorities are cognisant that generating adequate own revenues can help break the continuation of the dependency and dominance relationship with central government, but central government is also aware and time and again intervenes by adding layers of unnecessary bureaucracy (Cox 2010).

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5.2. The Local Authorities' Revenue Collection Methods and their Efficacy.

Local authorities have made attempts to use various methods to raise revenue collected. In the past two decades, the Government of Tanzania put in place several revenue collection reform measures to improve the collection. Among these, reforms are the Local Government Reform Programme and Public Financial Management Reform Programme (National Audit Office, 2020). Other efforts undertaken include outsourcing revenue collection to private agents, reviewing bylaws, broadening tax bases and keeping tax rates low (Kessy, 2019). Despite these reforms and other efforts, the revenue collection in LGAs remains ineffective (National Audit Office, 2020). This necessitated the introduction of an information and communication technology (ICT)-mediated revenue collection system to eliminate the weaknesses and anomalies exhibited by the manual system which existed before.

This study's findings are that manual and traditional systems were the methods used to collect revenue by the local authorities and a few banks transfer in spite of the possible availability of electronic payment systems which are increasingly more efficient and effective in making payments.

The study further revealed that an open meeting (Department or Sections) was the nature of local authorities' assessing the existing revenue collection strategy and that they often assessed the revenue collection strategies annually. Local government authorities (LGAs) in developing countries play a significant role in delivering public services such as health, education, water, housing, local transportation services and other essential services for socio-economic development (McCluskey et al., 2017) and it is for this reason that the manner or method of assessing revenue collection was deemed not effective.

5.3. Discussion of the Model to Improve the Local Authorities' Own Source Revenue.

Enhancing own source revenue mobilization involves the implementation of various strategies that make it easier for the Local Authorities to collect revenue, such as revenue collection and management, updating billable revenue databases, and revenue forecasting, among others. The study revealed various capacity gaps in developing a revenue generation model, ability to collect, account, and manage these financial resources for improved service delivery. Adopting the internationally accepted Tax Administration Diagnostic Assessment Tool (TADAT) framework for Tax and Non-Tax Revenue Administration is the starting point as it focuses on nine key performance outcome areas that cover most revenue generation, administration functions and processes. These include integrity of the registered revenue data base, effective risk management, supporting voluntary compliance, timely filing, timely payment, accurate reporting, effective dispute resolution, efficient revenue management and accountability and transparency.

This model, coupled with equitability of service provision, gives rise to a broadened revenue base for the local authorities (cow horn formation in revenue collection).

6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study established that local authorities are cognizant of the facts that generating adequate own revenues can help break the continuation of the dependence and dominance relationship with central government. Unfortunately, local authorities are unable to generate sufficient own revenues since the national government has taken up most revenue streams in the districts and put in place regulations that restrict generation and collection of own revenues. As a result, there is need for central government to return local authorities' revenue streams to enhance local revenue generation with ultimately enhancement of local authority fiscal autonomy.

The study also established that other major constraints to internal revenue generation included continued delay to release decentralized functions by central government, lack of political will from central government, failure to implement the agreed decentralized structure by central government, failure to relinquish some revenue streams to local authorities, government's unclear policy guidance on decentralization and lack of a standardized system as well as a monitoring mechanism. These bottlenecks impeded the efficacy in revenue collection and generation by local authorities.

The results of this study suggest the irrefutable need to review the implementation of decentralization and promptly address all the impeding factors to own source revenue by local authorities to which the TADAT model came into view as a starting point along with equitability in service provision to all for a broadened revenue base.

6.2. Recommendations

6.2.1. Weak Formulation and Implementation of the Legal framework.

It is evident that despite the legal framework being sufficient, the ones supporting collection of revenue are not enforced fully because the central Government have conflicting pieces of legislation targeting the same revenue sources. It is, therefore, recommended that the legal framework supporting revenue collection should be harmonized or reviewed to allow the Local

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Authority to exercise its full potential such as amending section 3 of the Rating Act No. 21 in order to give local authorities the possibility of appointing private valuers to conduct valuation exercises as opposed to the current provision where only Government Valuation Department (GVD) can conduct the valuation for all 116 local authorities in Zambia, which has not been feasible.

6.2.2. Revenue Collection Methods.

To enhance efficiency and minimize human-cash contact and corruption opportunities, a simple computerized revenue management system would be feasible. Such a system should be able to automate the key tax administration functions of registration, assessment, collection and accounting for the revenue collected. The Zambia Revenue Authority, Ministry of Lands and Natural Resources and other key institutions in Zambia have well designed revenue collection systems to manage local revenue collection. It is recommended that; local authorities computerize all its revenues sources to minimize corruption in revenue collection and accounting.

6.2.3 Model for Improved Own Source Revenue Generation.

The study recommended the adoption of the internationally accepted Tax Administration Diagnostic Assessment Tool (TADAT) framework for Tax and Non-Tax Revenue Administration which should be the starting point, which focuses on nine key performance outcome areas that cover most revenue generation, administration functions, and processes. These areas include integrity of the registered revenue data base, effective risk management, supporting voluntary compliance, timely filing, timely payment, accurate reporting, effective dispute resolution, efficient revenue management, and accountability and transparency.

REFERENCES

- 1) GRZ (2019) Report of the Auditor General on the accounts of parastatals bodies and other statutory instruments for the financial years 2014, 2015 2016 and 2017. Lusaka: government printers.
- 2) Bosco, J. N. (2015) The Sources of local authorities' revenue in Toronto. Toronto: Canadian publishers.
- 3) Chimba, F (2019) .20 councils in Zambia benefit from the € 2 million donated by the European Union for development projects. Available: <https://www.lcc.gov.zm/the-cityof-lusaka/>. (Accessed in June 2024).
- 4) Bwalya, N. (2013). Effectiveness of Contracting Out of Solid Waste Management: A case Study of Lusaka. Lusaka. University of Zambia press.
- 5) Carpo, k. (2020) Business Permit in the Philippines. Accessed on <https://kittelsoncarpo.com/business-registration/business> June 2024.
- 6) Central statistics office (2010) 2010 census of population and housing. Lusaka: CSO
- 7) Chibiliti, G.C. (2010). An Assessment of the Sources of Revenue for Local Authorities in Zambia: A Case of Copper belt Based Local Authorities, Masters Dissertation, Copperbelt University.
- 8) Alahverdizaeh, H. (2015) The relationship between the unitary state system and the national unity. Tehra: AshrafiEsfahani Hwy publishers.
- 9) Bandiera, O and Ashraf, N. (2018) Decentralization of Government in Zambia: Baseline survey and a global comparative analysis of strategies and barriers to implementation. <https://www.theigc.org/project/decentralisation-of-government-in-zambia>. Accessed in June 2024
- 10) GRZ (2019). Local government Act, 2019. Lusaka. Government printers.
- 11) GRZ. (2018). Public finance management Act ,2018. Lusaka: Government printers.
- 12) Cottarelli, C. (2011). Challenges of Budgetary and Financial Crisis in Europe", Presentation by Carlo Cottarelli, Director, Fiscal Affairs Department, International Monetary Fund.
- 13) Justin, F. J. (2018) The Case for Effective Environmental Politics: Federalist or Unitary State? Comparing the Cases of Canada, the United States of America, and the People's Republic of China. China: Centre for International Sustainable Development Law.
- 14) Gidisu, T. E. (2012). Automation System Procedure of the Ghana Revenue Authority on the Effectiveness of Revenue Collection: A Case Study of Customs Division. Unpublished MBA Thesis, Kwame Nkrumah University of Science and Technology. Government, Kenya. European Journal of business and management.
- 15) Gyamfi, E. (2014). Effective revenue mobilization by districts assemblies: A case study of Upper Denkyira East Municipal Assembly of Ghana. Public Policy and Administration, 2(1),97-122.
- 16) Khan, R., Khan, F., & Khan, M. (2011). Impact of Training and Development on Organizational Performance. Global Journal of Management and Business Research, 11, 62-68. McMillan, J., & Schumacher, S. (2006). Research in Education: Evidence-Based Inquiry (6th Ed.). Boston: Pearson Education.

An Analysis of Contributory Factors to Low Own Sources Revenue (OSR) in Local Authorities in Zambia: A Case Study of Muchinga Province

- 17) Chongo, K (2017) Lusaka City Council stands to lose over K1.2 million monthly in uncollected levies. Accessed in June 2024 at <https://www.lusakatimes.com/2017/07/06/lusaka-city-council-stands-lose-k1-2-million-monthly-uncollected-levies>
- 18) Chula, I. (2017). Effectiveness of garbage collection by private companies: A case study of Lusaka. Lusaka: University of Zambia press.
- 19) CLGF (2018) The local government system in Zambia. Retrieved from www.clgf.org.uk/zambia on 13th June at 12:30.
- 20) Forum (2018) The local government system in Zambia. Retrieved on www.ipu.org/wmne/classif.htm. Accessed in June 2024
- 21) Frumence (2012) challenges to the implementation of health sector decentralization in
- 22) Tanzania: experiences from Kongwa district council. Retrieved on www.ipu.org/wmne/classif.htm accessed in June 2024
- 23) Gee, C. (2020) Making drones work in local government. Accessed in June 2024 At <https://www.techuk.org/insights/opinions/item/16546-making-drones-work-in-local-government>.
- 24) Hapompwe, C.C., Banda, N., and Chalwe, A.N. (2024). Examining Critical Success Factors for Africa's Sustainable Industrial Development with Special Reference to Zambian Manufacturing Sector – Challenges, Prospects & Opportunities. *Journal of Economics, Finance and Management Studies*. Volume 07 Issue 01, 571-584. DOI: 10.47191/jefms/v7-i1-59. ISSN (print): 2644-0490, ISSN (online): 2644-0504
- 25) Hapompwe C.C., Karim A, M., and Kambikambi, T.T. (2020). An Empirical Evaluation of Public Secondary Schools' Education Financing and Its Impact on Service Quality in Lusaka, Zambia. *African Journal of Education and Practice*, ISSN 2519-0296 (online), Vol.6, Issue 2. No.2. pp 13 – 32.
- 26) Haradhan, M (2017). Two Criteria for Good Measurements in Research: Validity and Reliability. Bangladesh: Premier University.
- 27) Kabir, S.M. (2016) Basic Guidelines for Research: An Introductory Approach for all disciplines. Bangladesh: Book Zone Publication.
- 28) Lawrence, N. (2014) Social Research Methods: Qualitative and Quantitative Approaches. Edinburgh: Pearson Education Limited.
- 29) Lusaka City Council, (2017). The City of Lusaka, Available: <https://www.lcc.gov.zm/the-city-of-lusaka/>. (Accessed in June 2024).
- 30) Mboyonga, k. (2018) Effective Rates Collection Via GIS Application. The Case of Lusaka City Council, Zambia. Accessed in June 2024 at <https://www.grin.com/document/497327>
- 31) Yin, R. (2013). Case Study Research: Design and Methods. Sage Publications, Thousand Oaks.
- 32) Laurent Ngoyo, E. L. (2016). Factors Affecting Internal Revenue Mobilization in Local Government Authorities in Tanzania.
- 33) Leady, P.D and Ormrod, J.E. (2010). Practical Research: Planning and Design (9th ed.). New Jersey, USA: Prentice-Hall.
- 34) Lolojih, P. K. (2014). Local Government and Service delivery. 50 Years of Local Government in Zambia, pp. 152-180.
- 35) Lolojih, P. K. (2014). Local Government and Service Delivery. 50 Years of Local Government in Zambia, pp. 152-180.
- 36) Makasa, K., and Hapompwe, C.C. (2024). An Assessment of Factors Affecting Employee Performance in Zambian Local Authorities: A Case Study of Lukulu Town Council. *Journal of Economics, Finance and Management Studies*, Volume 07 Issue 02, DOI: 10.47191/jefms/v7-i2-41.
- 37) Maurice Ayodele Coker, F. O. (2015). Challenges of Expanding Internally Generated Revenue in Local Government Council Areas in Nigeria. *Journal of Sustainable Development*.
- 38) 66 Nicodemus Karori, D. W. (2016). Influence of Revenue Collection Efficiency on the Operational Performance of Kisii County Government, Kenya. *International Journal of Social Sciences and Information Technology*, 235-240.
- 39) Niek, S. J. (2011). Fiscal Performance and Sustainability of Local Government in South Africa An empirical Analysis.
- 40) office, Z. A. (2017). Report of the Auditor General on the Review of Operations of Local Authorities. Lusaka: Government Printers, Zambia.
- 41) Ombui, P. K. (2018). Determinants of Optimal Revenue Collection in County Governments in Kenya: A Case of Bomet County. *International Journal of Management and Commerce Innovations*, 91-99.
- 42) IGC (2016) Decentralisation of Government in Zambia: Baseline survey and a global comparative analysis of strategies and barriers to implementation. Accessed June 2024 at <https://www.theigc.org/project/decentralisation-of-government-in-zambia-baseline-survey-and-a-global-comparative-analysis-of-strategies-and-barriers-to-implementation>
- 43) MLGH (2016) Revised guidelines on the management and utilization of the constituency development fund. Lusaka: government printers.

An Analysis of Contributory Factors to Low Own Sources Revenue (OSR) in Local Authorities in Zambia: A Case Study of Muchinga Province

- 44) Mushimbwa, K. (2020) Examination of strategies of local revenue collection in local government authorities in Zambia: a case of Gwembe District Council. Lusaka: UNZA.
- 45) Pelekamoyo, G. (2011). Local autonomy and central government control in Zambian local authorities. Lusaka: university of Zambia press.
- 46) Siwale, J., Hapompwe, C.C., Kukano C., Kabanda N.C., & Phiri, N. (2021). Analysis of the Impact of Financial Illiteracy on Small and Medium Enterprises' (SMEs) Growth in Lusaka's Central Business District, Zambia. International Journal of Scientific and Research Publications, Volume 11, Issue 6, June 2021 124 ISSN 2250-3153. 10.29322/IJSRP.11.06.2021.p11417 <http://dx.doi.org/10.29322/IJSRP.11.06.2021.p11417>
- 47) World Bank (2019) world development report: the changing nature of work. New York: world Bank.



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