EXAMINING THE EFFICIENCY OF FUEL MANAGEMENT ON SERVICE DELIVERY WITHIN LOCAL AUTHORITIES IN ZIMBABWE

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ABSTRACT

The study sought to examine the efficiency of fuel management on service delivery within local authorities in Zimbabwe. A quantitative methodology accompanied by a 5-point Likert scale questionnaire was deployed to collect data from four local authorities within Harare Metropolitan Province. The stratified random sampling technique was utilized to define the sample of 347 participants, with the aid of RAOSOFT sample size calculator. SPSS (version 20) software was used for analysing data. The study findings indicate that, inefficient fuel management processes significantly contributed to poor service delivery. Also, the results showed a significant positive correlation between efficient fuel management practices and service delivery. It therefore follows that; enhanced service delivery tends to correlate positively with improved fuel management practices. The results suggest that prioritizing efficient fuel management processes optimizes resource allocation which in turn enhance service delivery performance within local authorities. Consequently, the study recommends the implementation of electronic fuel monitoring systems to streamline fuel management process thereby improving transparency and accountability.

Keywords: fuel management, service delivery, local authorities, efficiency, Zimbabwe.

1. INTRODUCTION

Fuel management generally represents a significant share of the fleet management expenditure, which is projected to be around 30 to 40% of the overall fleet operating costs (Barun, 2021). In developed countries like the United States, fuel economy is an important consideration in federal fleet replacement plans (Bentley &Hodge, 2020). In this regard, it is essential to comprehend how fuel management and service delivery are related for a number of reasons; including cost reduction, operational effectiveness and service dependability. Accurately monitoring fuel consumption and undertaking regular fuel storage capacity inspections assist local authorities in allocating the resources more efficiently and controlling expenditures. Harcourt and Lawson (2024) observes that efficient fuel management procedures improve operational efficiency by ensuring that vehicles have enough fuel to deliver services reliably

and on schedule. This underscores the importance of fuel management in the context of fleet operations and service delivery.

Globally, fuel management procedures are crucial for improving effective fleet management operations. The implementation of fuel saving techniques and utilization of technology to ensure precise monitoring and usage control is a fundamental aspect of global fleet management best practices (Verma, et al., 2021; Oluwashola & Ige, 2022). A study conducted by Rashid and Lugaric (2018) on green fleet management for public sector organisations within United Arab Emirates recognized the wide spread use advanced fuel tracking systems that leverage technologies like Global Position System (GPS) tracking of fuel usage. These computerized systems facilitate the monitoring of real time fuel consumption and uncover inefficiencies within the fuel management system (Romero et al., 2024). In addition, computerized fuel systems frequently generated reports which help to keep track of fuel usage patterns, and in turn improving fleet management. The analysis of fuel consumption data helps in making informed decisions pertaining fuel distribution and allocation thereby enhance service delivery.

In contrast to local authorities within the developed nations, most public sector organisations in countries such as Tanzania face numerous challenges in effective fuel management. Mismanagement of fuel is rampant which mostly characterised by lack of proper monitoring, accountability and corruptions, resulting in fuel theft and misuse (Ally, 2020). Despite the persisting issues throughout many African nations stemming from inadequate resources and capacity restrictions, in Kenya some public sector organisation have made notable strides in effective fuel management. In particular, the Kenyan Parliamentary Service Commission utilize electronic fuel card systems which records critical data, including the quantity of fuel issued and refuelling time for every particular vehicle (Kanuku & Ng'eno, 2023). The use of these electronic fuel card technology plays a pivotal role for effective tracking of fuel consumption, data administration and documentation thereby improving fleet management efficiency. As a result, the electronic transmission of this data facilitates for real-time access of fuel records, which promotes effective fuel management operations.

Fuel management within local authorities in Zimbabwe has exhibited numerous issues, including deficiencies in accountability and transparency to effectively monitoring fuel consumption resulting in considerable obstacles that adversely affect service delivery. These issues have a direct impact on the community since they may contribute to hindrance of access to necessary services, which could endanger public safety. For instance, garbage accumulation,

poor water supply management, health services have severely affected the community exposing them to health hazards and hindering them access to services. In addition, several of local authorities in Zimbabwe fail to adequately account for fuel allocated for assigned projects (Auditor General Report, 2021). For example, despite maintaining a fuel record, the Marondera council failed to account for around 10 000 litres of fuel (Zim Eye, 2022). Similarly, Bindura council was unable to account for over 1 000 litres of petrol earmarked for Zimbabwe National Roads Authority (ZINARA) projects (ibid). If the issue of inefficient fuel mismanagement fails to be addressed, it goes on to affect the efficiency and dependability of crucial services that local authorities deliver, which will compromise the of community's well-being. The severity of these operational challenges encountered by local authorities in Zimbabwe necessitates the researcher to assess fuel management approaches and their influence on service delivery.

Prior research conducted by Manawa et al. (2020), Kajongwe et al. (2021), and Chiparo et al. (2022), has concentrated on green fleet management, vehicle fleet management, and public service delivery broadly. However, there is scarcity of research clearly addresses the practical knowledge gap that relates to the challenges surrounding fuel administration procedures within local authorities and the detrimental effect that it has on service delivery. Therefore, the study aimed to fill this practical gap by providing tailored recommendations to improve fuel management and service delivery within local authorities in Zimbabwe. Specifically, the study sort to assess the efficacy of the existing fuel management approaches employed by local authorities; evaluate the extent to which fuel management procedures affect service delivery and recommend suggest strategies to optimize fuel management effectiveness within local authorities in Zimbabwe.

LITERATURE REVIEW

This section provides an overview of the literature relates to fuel management and service delivery and justify the basis upon which of hypothesis were developed.

Fuel management

Fuel management entails a comprehensive procedures and techniques meant to efficiently monitor, usage, and control fuel (Aflabo et al., 2020). According to Romero et al. (2024) fuel management is a strategic approach through which tracking and monitoring fuel consumption helps to attain cost effective fleet management operations. These definitions explicitly show that fuel management is an integral element within fleet management system, incorporating

fundamental activities for efficient control and optimization of fuel usage. Verma et a. (2021) reiterates that accurate record keeping and the establishment of control mechanisms helps to safeguard fuel inventories. In addition, regular monitoring of fuel usage patterns and consumption assists in recognizing inefficiencies and detecting prospective issues within the entire fuel management process. Petrović and Vujanovic (2024) highlight the significance of real-time fuel monitoring systems which offer precise information usage and consumption, facilitating informed decisions regarding fuel efficiency. In order to promote transparency and accountability within the fuel management system, Zhang et al. (2021) advocates the implementation of electronic fuel management systems that simplifies monitoring and tracking of fuel usage. Therefore, the adoption of comprehensive monitoring, documentation, administration and control mechanisms are essential in enhancing operation and mitigating the possibilities of fuel theft and unauthorized usage.

Service delivery

Within the context of local authorities, service delivery pertains to public services. Service delivery is the mechanism through which the local or state bodies provide a broad spectrum of services such as health services, water supply, refuse collection, public infrastructure development and maintenance (Sawaneh, 2022). The distinction between effective service delivery and ineffective service delivery lies in the provision of high-quality, dependable, timely, and consistent services to users (Mamokhere, 2022; Pareek & Sole, 2022; Rulashe & Ijeoma, 2022). Consequently, failure to prioritize the aspects relating to quality, dependable, timely, and consistent results in poor service delivery, which in turn affects the socio-economic welfare of the residents. Overall, the concept of good service delivery speaks to the extent to which “services provided by the listed sectors meet or exceed the expectations of beneficiaries (general public)” (Shittu 2020, p1). For this to be realised, an inter-agency and inter-departmental approach is key; this therefore entails that concerned departments must effectively coordinate to meet service goals.

In Zimbabwe however, service delivery is the direct contrast of the ideal characterisation above, it is mainly shaped by the principal agent relationship, the end user is rarely seen as a customer but rather a subject not entitled. It therefore follows that the governance approaches in Zimbabwe local authorities are not hinged on the need to effectively meet the needs of the ratepayers. As noted by Marumahoko et al. (2020) local authority service delivery in Zimbabwe is not a function of developmental governance. Such a scenario is compounded by a

combination of intertwined factors, including inadequate human and financial resources, corruption and mismanagement, political interference, rapid population growth, and poor economic performance (Chikwariro et al., 2021; Maibeki et al., 2022; Mupandanyama, 2023). Given this, it is critical to emphasise that, efficient management of resources including fuel is part of the puzzle. The existence of inefficient fuel management procedures further compounds the already existent crisis of governance and service delivery.

Hypothesis development

Effective fuel management is essential for optimizing service delivery. A study conducted by Harcourt and Lawson (2024) on oil and gas companies in Nigeria underscored the critical role of effective fuel monitoring, consumption, record-keeping, and control mechanism in improving organisational operations. Accurate monitoring of fuel usage and consumption contributes to improved operational efficiency and organisational performance, through detecting challenges such as fuel theft and vehicle misuse (Kanyepe, 2023). Moreover, Aflabo et al. (2020) underscore that efficient fuel monitoring is crucial for ensuring uninterrupted service delivery. The adoption of fuel-efficient techniques within an organization results in cost savings and resource optimization, as fuel is utilized effectively, hence enhancing service reliability and ensuring timely delivery (Mehmood, 2021; Chaudhari et al., 2024). Similar to this, a study by Koba, and Svystun (2021) found that reliable fuel documentation helps organizations monitor fuel usage trends, pinpoint areas for development, and efficiently schedule fuel procurement. In this regard, maintaining of accurate records on fuel usage allows local authorities to manage to reduce fleet management costs, and effectively allocate sufficient fuel for service delivery needs. Furthermore, Farahpoor et al. (2024) underscores the need for data driven fuel management control systems for enabling reliable and effective operations. Drawing on the empirical analysis, the study thus posited that fuel management procedures positively affect service delivery by local authorities.

METHODS AND METHODOLOGY

The research utilized a quantitative methodology grounded by the positivist philosophy. The quantitative technique assisted the researcher in achieving objective measurement, statistical analysis, comparisons, and data generalizability (Taherdoost, 2022; Ghanad, 2023). Moreover, positivism facilitates the establishment of relationships between variables, enabling researchers to formulate hypotheses and generalize the results to broader contexts (Ali, 2024). The study utilized a cross-sectional design, which involved collecting data from four (4) selected local

authorities within the Harare Metropolitan province in Zimbabwe. This design was selected due to its abilities for concurrent collection of extensive data, which proved to be economical for the researchers (Cvetkovic-Vega et al., 2020). Furthermore, by using a cross-sectional approach, the researchers were able to provide detailed information concerning how fuel management and service delivery interact within local authorities.

A total of 3500 participants comprised the study population, from which a sample size of 347 employees was selected by means of Raosoft sample size calculator. The online Raosoft sample size calculator was utilized because of its simplicity, accuracy and the ability to provide instant results. Participants were subsequently chosen from the four (4) local authorities through stratified random sampling. This sampling technique guaranteed adequate representation and enhanced coverage of the respondents, which was consistent with the recommendations by (Iliyasu &Etikan, 2021). Data collection processes took place from September 2024 to October 2024, with respondents selected from different departments including transport, administration, procurement, finance and engineering form the selected local authorities in the Harare Metropolitan Province. This approach allowed the researchers to gather insights from individuals across different levels of management, which included managers, officers, supervisors, mechanics, drivers, and clerks, thereby capturing diverse perspectives.

A structured questionnaire was employed to gather quantitative data. A questionnaire was considered ideal for data collection because of its ability to collect of statistical data from a huge size of respondents in a manner that is economical (Taherdoost, 2022; Hochwaldet al., 2023). The questionnaire was distributed electronically to the participants via email and mobile platforms where necessary, allowing the respondents to complete it whenever it was convenient. The questionnaire also contained a cover letter soliciting informed consent with the objective of safeguarding the anonymity of the respondents The questionnaire utilized closed-ended questions, allowing the respondents to select their answers from a 5-point Likert scale comprising of 1 =Strongly Disagree, 2 = Disagree, 3 = Neutral OR Uncertain, 4 = Agree, 5 = Strongly Agree. The 5-point Likert scale was utilized because it enabled standardized measurement and straightforward comparison of result. The questionnaire consisted of two (2) sections, detailed in table 1, encompassing Fuel Management (FM) and Service Delivery (SD).

Table 1. Statement for the questionnaire	
Fuel Management	
Code	**Questionnaire statement**
FM_1	The current fuel management system within the local authority effectively monitors fuel usage for vehicles and equipment
FM_2	Fuel consumption records are regularly updated and reconciled
FM_3	The fuel consumption records are effective in identifying and addressing inefficiencies in fuel management system in local authorities
FM_4	The local authority has well-established procedures for detecting fuel theft
FM_5	The local authority actively implements fuel-saving measures to enhance overall fuel management efficiency.
Service Delivery	
SD_1	There is poor service delivery within local authorities due to ineffective fuel management
SD_2	Mismanagement of fuel hinders the timeliness of service delivery in local authorities
SD_3	Inadequate fuel management frequently leads to disruptions in the provision of essential services in local authorities
SD_4	Insufficient fuel management often results in reduced access to service delivery
SD_5	Inefficient fuel management practices negatively affect the quality and reliability of services provided in local authorities

Source: Authors (2025)

The researcher used the Statistical Package for Social Science (SPSS) version 20 for analysing the collected data, that included conducting reliability and validity test, analysing descriptive statistics and testing the hypothesis using correlation analysis. Conversely, to confirm the questionnaire's validity, the researchers undertook a pilot test, utilizing participant comments as a foundation for developing and validating the instrument. Lastly, research ethics were maintained throughout the study by ensuring confidentiality, anonymity, as well as informed consent.

RESULTS AND DISCUSSION

This section presents the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test which was used for establishing sampling adequacy, while Cronbach's alpha and convergent validity tests were used to test for reliability and validity of the study.

KMO and Bartlett's Test

The study used the KMO and Bartlett's Test for the establishing the sample adequacy as presented in table 2. The KMO measure of sample adequacy for the study was 0.849 that was above the recommended KMO value of 0. 7 which is regarded as appropriate (Nkansah, 2018). Therefore, in this study the value of 0.849 indicated that the study variables had a degree of correlation.

Table 2. KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.849
Bartlett's Test of Sphericity	Approx. Chi-Square	35395.322
	Df	153
	Sig.	.000

Source: Research Data (Authors, 2025)

Furthermore, the reliability statistics presented in Table 3 show the internal consistency of the two study variables, with Cronbach's alpha values of 0.899 and 0.883 for fuel management and service delivery respectively. The reliability statistics show high reliability amongst all the study variables as recommended that good reliability score should greater than 0.7 (Sürücü & Maslakçı, 2020). Therefore, the study results were reliable as exhibited by Cronbach's alpha values in Table 3.

Table 3. Reliability statistics

Variable	Cronbach Alpha items	Number of Items
Fuel Management	.899	5
Service Delivery	.883	5

Source: Research Data (Authors, 2025).

Convergent validity test results

The findings presented in table 4 regarding convergent validity indicate that both the fuel management and service delivery constructs exhibit robust factor loadings, reflecting a significant correlation between the constructs which were being assessed. The reliability values for individual items for the constructs were above minimum threshold, indicating that each item had a crucial role in enhancing the reliability (Ali, 2024). Additionally, the Cronbach's Alpha values exceeded the acceptable threshold of 0.7, indicating strong internal consistency within

each construct (Ghanad, 2023). The composite reliability values were high, thereby reinforcing the convergent validity.

Table 4. Convergent validity

Construct	Item	Standard factor Loading	Individual Item reliability	Cronbach's Alpha	Composite reliability
Fuel Management	FM_1	0.879	0.817	0.899	0.780
	FM_2	0.765	0.721		
	FM_3	0.871	0.840		
	FM_4	0.714			
	FM_5	0.746			
Service Delivery	SD_1	0.762	0.811	0.883	0.841
	SD_2	0.714	0.860		
	SD_3	0.850	0,841		
	SD_4	0.723	0.794		
	SD_5	0.766	0.810		

Source: Research Data (Authors, 2025)

4.3 Descriptive statistics

Table 5 presents the descriptive statistics related to the fuel management and service delivery.

Table 5. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
FM_1	284	1.00	5.00	2.111	1.166
FM_2	284	1.00	5.00	3.198	1.016
FM_3	284	1.00	5.00	2.532	1.531
FM_4	284	1.00	5.00	1.567	1.197
FM_5	284	1.00	5.00	2.209	1.127
MEAN				**2.323**	**1.207**
SD_1	284	1.00	5.00	3.156	1.352
SD_2	284	1.00	5.00	4.124	1.206
SD_3	284	1.00	5.00	4.987	1.464
SD_4	284	1.00	5.00	4.692	1.292
SD_5	284	1.00	5.00	4.890	1.185
MEAN				**4.370**	**1.300**
Valid N (listwise)	284				

Source: Research Data (Authors, 2025)

Fuel management

Table 5 present the descriptive statistics of fuel management which shows a low mean score of 2.323 and standard deviation value of 1.207. This indicates the inefficiency of fuel management processes within local authorities in Zimbabwe. The findings point to numerous challenges emanating from the use of poor fuel monitoring and lack of robust systems for regular updating and reconciling fuel consumption records. Inefficient fuel management has in turn contributed to delays and disruptions of service delivery within local authorities. Chaudhari et al. (2024)

underscore the importance of investing in fuel management technologies which fosters effective fuel management. In addition, studies by Rashid and Lugaric (2018); Oluwashola and Ige (2022), contends that poor tracking of fuel consumption results inaccurate fuel records that are prone to misuse and thereby contributing to high operational costs. A study by Chiparo et al. (2022) concur that inefficient fuel management results increase fleet management costs, decreased operational performance and delays in service provision.

Service delivery

Table 5 show a high mean score of 4.370 and standard deviation of 1.300, points to poor service delivery as a result of mismanaged fuel. The findings revealed that poor service delivery has resulted in delays and disruptions to services such as refuse collection and waste water management as supported by (Marumahoko et al., 2020). In addition, the findings reveal the inefficiencies in fuel allocation, distribution, ineffective scheduling and planning. These shortcomings have compromised timely provision of services, which have affected the livelihoods of the resident. Furthermore, studies by Munuhwa et al. (2020), Maibeki et al. (2022) acknowledged that local authorities in Zimbabwe are characterized by poor service delivery which is affected has impacted on the livelihood of the entire population. According to Auditor General Report (2019) service delivery has been on the decline, because most local authorities in Zimbabwe failed to maintain accurate records of fuel consumption that resulted in misappropriation of fuel. Therefore, the results show a continuous cycle of poor service delivery that has been necessitated by poor fuel management and the need for improvements in fuel management system.

Hypothesis testing

Table 6 provides the correlation coefficients, which were used to test the study hypothesis.

Table 6. Correlation coefficients for the study variables

		FM	SD
FM	Pearson correlation Sig. (2-tailed) N	1 .003* 284	
SD	Pearson correlation Sig. (2-tailed) N	1 .000*** 284	1 .000* 284

***.** *Correlation is significant at the 0.01 level (2-tailed).*
Source: Research Data (Authors, 2025)

The results in table 6 of the hypothesis testing show that there was a significant positive correlation between fuel management and service delivery within local authorities in Zimbabwe. The pearson correlation coefficient between Fleet Management (FM) and Service Delivery (SD) was 003, significant at the $p<0.01$ level. Therefore, the hypothesis results show that there was a strong and positive relationship between efficient fuel management and service delivery within local authorities in Zimbabwe. This means that when fuel management practices are improved, there tends to be an improvement in service delivery. The results highlight the importance of local authorities in Zimbabwe placing strategic emphasis on enhancing fuel management practices to positively influencing service delivery. Prioritizing fuel management leads to more efficient resource allocation and better service delivery performance.

The findings concur with the past studies by Kajongwe (2021) and Chiparo et al. (2022) which states that effective fuel management practices enhance service delivery. Whereas Rashid and Lugaric (2018) reiterate that the integration of technology within fuel management system improves operational efficiency. In addition, study conducted by Kanyepe (2023) within the mining sector in Zimbabwe found out that fuel management practices positively influence organizational performance. Additionally, Aflabo et al. (2020) states that, effective fuel management enhances the timeliness and reliability of service delivery. Adequate fuel supply guarantees vehicle availability, which can enhance service delivery through the provision of timely and dependable services. The results of hypothesis testing offer strong evidence supporting the positive correlation between fuel management and service delivery in local authorities in Zimbabwe. The findings highlight the necessity of emphasizing efficient fuel management practices as a crucial element in enhancing service delivery.

CONCLUSION

The study sheds more light on the critical relationship between fuel management processes and service delivery within local authorities in Zimbabwe. The results underscore that effective fuel management significantly influences service delivery, thereby stressing the importance for local authorities to concentrate on improving fuel management procedures in order to improve service delivery. The study revealed that local authorities are characterized by poor fuel management processes which significantly affects prompt and dependable provision of service delivery. The study contributes to the existing literature by providing practical insights into how local authorities can streamline their fuel management processes in order to enhance service delivery.

The findings have significant implications for management within local authorities, highlighting the necessity of investing in fuel management technologies that monitor fuel usage accurately and identifying inefficient within the processes, thereby minimising fuel theft. In addition, there is need for local authorities to consider implementing electronic fuel monitoring systems to improve transparency and accountability within the entire fuel management process. In terms of policy implications, the local authorities must emphasize fuel management as a critical component of their operational plan to enhance fuel use and service delivery performance.

LIMITATIONS OF THE STUDY

While this study provides valuable insights pertaining to the relationship between fuel management and service delivery within local authorities in Zimbabwe, it was necessary to recognize some limitations. Firstly, the study focused on local authorities within the Harare Metropolitan Province in Zimbabwe, and this limits the generalizing the findings to different economic sectors. Secondly, the study utilized self-reported data from questionnaire responds which could be biased and inaccurate. Finally, the study did not take into account external issues such as political intervention and economic restrictions, which could have an influence on fuel management procedures and service delivery within local authorities. Despite these limitations, the study addresses them by utilizing a large sample size to ensure a thorough comprehension of fuel management and service delivery. Consequently, these limitations create opportunities for future research of such nature to be undertaken in diverse contexts within Zimbabwe and other nations to enhance the generalizability of the findings. In addition, future research needs to be undertaken to explore the influence of external factors, including economic constraints and political interference, on fuel management practices and service delivery in local authorities in Zimbabwe.

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