The Lustrum Performance on Government Revenue for Eastern Zone Forestry Stations in Malawi (2019 – 2023)

Abstract: Effective revenue collection in forestry and government institutions offers various benefits to economic growth. A study was conducted to investigate the performance of Eastern Zone Forestry Stations (EZFS) in Malawi on government revenue collection from 2019 to 2023. Specifically, the study addressed the following questions: (1) what are the main sources of revenue collection at EZFS? (2) what is the level of performance in revenue collection at EZFS? (3) what challenges are encountered in revenue collection at EZFS? and (4) what strategies can be implemented for effective revenue collection at EZFS? The study collected both primary and secondary data. A structured questionnaire administered through Google Forms was used to collect primary data. The secondary data was subjected to a three-factor analysis of variance (ANOVA) in GenStat 18, while the primary data was subjected to a Chi-square test in SPSS 25. The results indicate that there are seven main sources of revenue in Eastern Zone Forestry Stations. The main sources of revenue collection identified are charcoal sales, firewood sales, shares from the co-management block, licence fees, log sales, pole sales, and transfer conveyance certificates. However, the main sources of revenue significantly (P<0.001) differed. Log sales contributed the highest (79.3%) to the total revenue for the past five years followed by licences fees (6.3%), then firewood sales (5.9%). Transfer conveyance certificates contributed about 5.8% to the total revenue collected. On the other hand, pole sales and shares from co-management were the least, contributing 0.9% and 0.8%, respectively. Furthermore, the study revealed that Zomba Mountain plantation contributed the highest (90.2%) to the total revenue collected among the forestry stations, while Balaka District Forestry Office contributed the least (0.2%). The study further revealed a decline in revenue collection for a period of the past five years from all the stations, except Dzonzi-Mvai Plantation, which registered an annual increase of 22.5%. Overall, the revenue for Eastern Zone Forestry Stations decreased annually by 18.3% over the past five years. Insufficient staff and poorly skilled revenue staff, inadequate supervision and monitoring of revenue generation, and lack of capacity to enforce compliance were identified as the major challenges encountered in revenue collection. The study further revealed the following as strategies for effective revenue collection: capacity building of those handling revenue, robust supervision and monitoring of revenue generation, development and implementation of revenue enhancement plan, and effective enforcement.

Keywords: Government Revenue; Lustrum; Performance; Capacity building; Enhancement plan

1. Introduction

Public revenue is defined as the money that a government receives from taxes and other sources (IFM, 2014; Bird, 2013). Generally, revenue mobilization is the act of marshaling, assembling, and organizing financial contributions from all incomes accruing from identifiable sources in an economic setting (Economists, 2016; Martinez, 2013; PMO-RALG, 2013).

Government revenue is important because the operations and functions of government agencies largely depend on the availability of revenue (PMO-RALG, 2013). Normally, government finance activities such as finance discretionary activities like community roads, bridges, water services; finance administration costs, and routine maintenance and administrative costs (James & Nobes, 2014). In addition, other researchers outline the importance of government revenue as follows: financing administration costs; financing maintenance costs and thus promoting ownership of projects; permitting the collection of localized and low-yielding revenues; guaranteeing the sustainability of service delivery and autonomy of local governments; regulating businesses and provides important services (Tembo & Mwanaumo, 2022; Martin, 2014).

Several studies on the performance of government agencies on revenue collection in different countries have been conducted by many researchers. Nevertheless, the disagreement on whether the level of performance of government agencies on revenue collection in different countries is good or not is still ongoing. Other researchers agree with the claim while others are in disagreement. However, the researchers have their own points to back up their claims depending on their school of thought. The purpose of analyzing the level of performance of government agencies is to understand how the government authorities put more effort into making sure that its revenue collection goals are reached (De Mooij & Keen, 2014; Keen, 2013). Most of the studies have reported a low level of performance in revenue collection, for instance, Local government councils in Tanzania (PMO-RALG, 2013), Harare and Bulawayo City Councils in Zimbabwe (Gideon & Alouis, 2013), River Nile State Council in Sudan (Fjelstad, 2013). On the other

hand, IFM (2014), reported a high level of performance in revenue collection in Kumasi Metropolitan Assembly (KMA) in Ghana. Therefore, the literature and conclusions from researchers show varied outcomes on the performance of revenue collection by government agencies. Hence, a need for research on individual government agencies.

The low level of revenue mobilization by government agencies in Malawi especially the Department of Forestry (DoF) has been a source of concern. In its effort to improve revenue collection, the Government of Malawi (GoM) recognized the need to reform revenue collection strategies for the DoF. It was strategized that different stations in the Department of Forestry receive a smaller or larger part of their funding from revenue raised at the national level, known as the Forestry Development Management Fund (FDMF). The FDMF is stipulated in the National Forest Policy of 1996 now the National Forest Policy of 2016 (GoM, 2016), and operationalized by the National Forest Act of 1997 and now the National Forest Act of 2020 (GoM, 2020). The introduction of FDMF in the DoF was expected to improve revenue collection. However, systematic studies are lacking that assess whether the introduction of FDMF in DoF has achieved its objectives as expected, and to draw lessons that can be used in the future in applying the experiences to other government agencies. In view of this, a study was conducted to determine the performance of the Eastern Zone Forestry Stations on government revenue collection for the period January 2019 to December 2023. Specifically, the study addressed the following objectives: (1) to identify the main sources of revenue collection in the EZFS, (2) to determine the level of performance in revenue collection among the EZFS, (3) to find out the challenges encountered in revenue collection in the EZFS, and (4) to identify functional strategies for effective revenue collection in the EZFS. The study is essential for effective fiscal policy formulation, economic stability, promotion of transparency and accountability in public finance, it also provides valuable lessons and best practices, i.e. it helps in benchmarking revenue systems and identify areas for improvement (Tembo & Mwanaumo, 2022).

2. Materials and Methods

2.1 Study Area

The study was conducted at Eastern Zone Forestry Stations (EZFS) in Malawi. EZFS in Malawi comprises of eight stations (Figure 1). These include Ntcheu District Forestry Office (DFO), Balaka DFO, Machinga DFO, Zomba DFO, Mangochi DFO, Nauko Plantations, Dzonzi-Mvai Timber plantations, and Zomba Mountain Timber Plantations.

2.2 Theoretical Framework

The theory supporting this research study was Agency Theory also known as Principal-agent theory (PAT). The theory was proposed by Ross (1973) and it explains two-partly relationships. According to Gauld (2016) PAT is a framework in economics and organizational theory that delves into relationships where one party (the principal) delegates work or decision-making to another (the agent). The principal aims to optimize their interest but faces a challenge due to the agent's divergent motivations or asymmetric information. Generally, the principal-agent theory of organizations compresses the idea that public sector performance can be improved if incentive-based contracts between different actors are implemented (Gauld, 2016). There are mainly four components of PAT. These include, principal, agent, information asymmetry, and agency costs. The principal entity delegates tasks or decisions to the agent and aims to align the agent's actions with their own interests, while the agent entity is responsible for executing tasks or making decisions on behalf of the principal. Agents might have their own interests or goals, potentially diverging from the principal's objectives. On the other hand, on information asymmetry, the principal may lack full information about the agent's actions, capabilities, or effort, leading to a challenge in effectively monitoring or controlling the agent's behavior. Finally, the agent costs arise due to the potential conflicts of interest between the principal and agent, as well as the costs incurred in designing mechanisms to align their interests (Thaler, 2015).

In this study, revenue collection was relevant to principal agent theory because it involves the agent collecting funds on behalf of the principal (Gauld, 2016). The principal-agent problem arises due to conflicting interests between the principal and agent. The principal wants the agent to collect maximum revenue efficiently, aligning with their goals. However, the agent might not always act in the principal's best interest. Instead, they might pursue personal gains, shirking responsibilities or engaging in opportunistic behaviors that benefit them but harm the principal (Thaler, 2015).

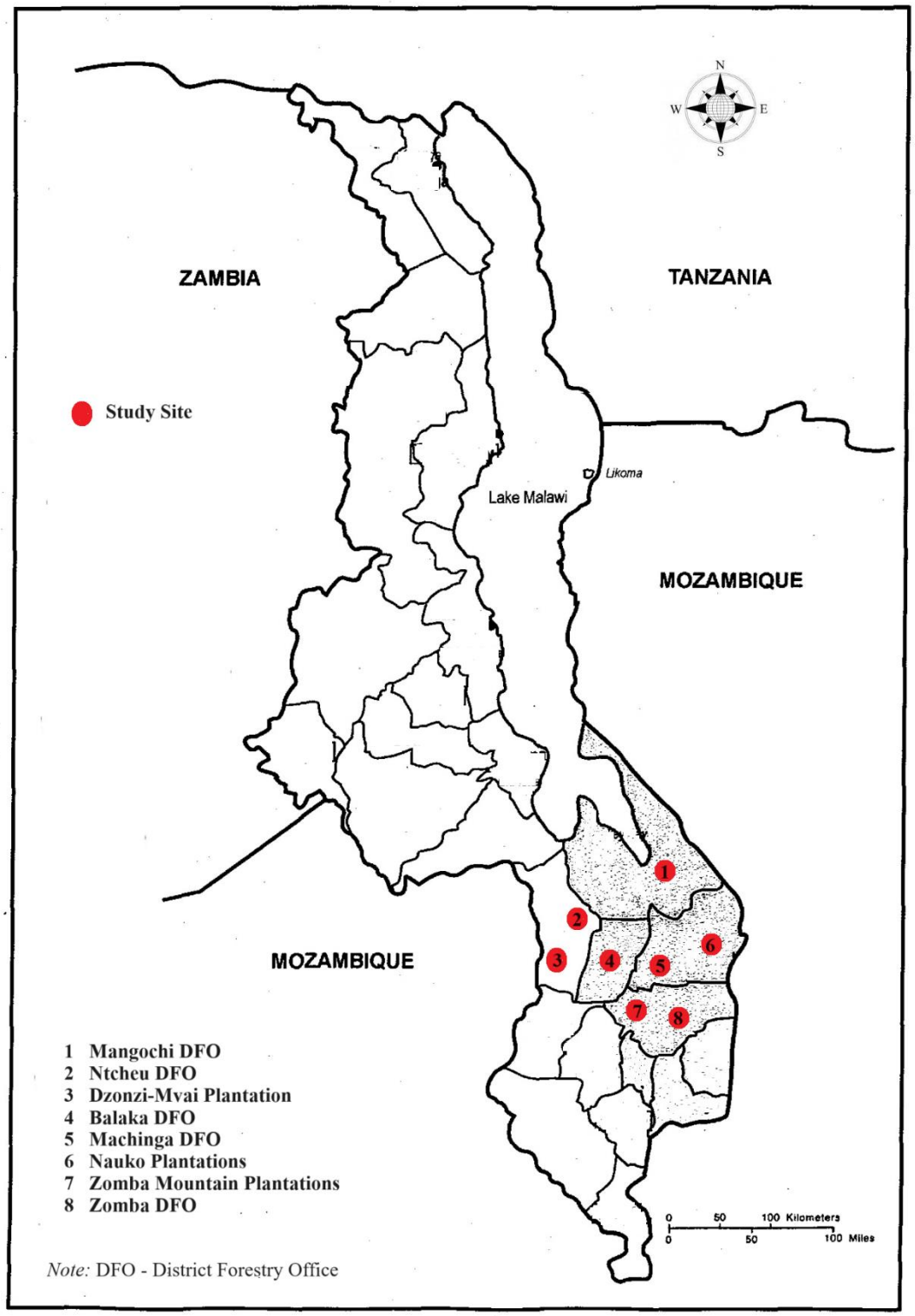

Figure 1, Location of the Study Area

2.3 Study Design, Target Population, and Sample Size

Orodho *et al*. (2016), defined research design as a scheme outlines or plan that is used to generate answers to research problems. This research adopted a mixed design. Creswell (2014) has defined mixed research design as a method that comprises both quantitative and qualitative methods of analysing data. The quantitative method generates numbers as data for analysis while the qualitative method generates words as data for analysis (Patton, 2015).

In this research, quantitative method was used to make inferences on the main sources of revenue collection, and the level of performance by different forestry stations. Qualitative method was used to analyse ideas from different individuals on the challenges encountered when collecting revenue, and what strategies can be put in place for effective revenue collection.

Bryman (2012) defines the target population as the universe of units from which the sample is to be selected. The target population were the technical forestry staff and accounts personnel who are involved in revenue collection at Eastern Zone Forestry Stations. The probability proportionate to the size sampling methodology was used to determine the sample size (Daniel & Cross, 2013). The formula is:

$$n = \frac{N*X}{X+N-1} \quad \text{.....(Equation 1)}$$

Where: n is the sample size, N is the population size, and X is defined as:

$$X = z^2pq/e^2, \quad \text{.....(Equation 2)}$$

p is the proportion of the population containing the major attribute of interest, q is (1-p), z is the standard variety at a given confidence level (α = 0.05), and e is the acceptable error (precision). A recommended allowable error range from 1% to 10% (Daniel & Cross, 2013).

In this study, a 5% error rate, a standard proportion (p) of 0.5, and a z-score at a 95% confidence level (α = 0.05) of 1.96 was used. The population of technical and accounts personnel was 56 at Eastern Zone Forestry Stations. Therefore, a sample size of 49 technical and accounts personnel was used.

2.4 Sampling Technique and Data Collection

Sampling technique are measures that are used to determine a portion that is to be used for particular research (Orodho *et al*., 2016). There are two main types of sampling methods namely probability (random) sampling and non-probability (non-random) sampling. Probability sampling is that in which the selection of the sample is made using a deliberate random process. While in non-probability sampling, the choice of the sample is left to the investigator (Daniel & Cross, 2013). In this study a random sampling technique was used to select the samples.

Daniel and Cross (2013) define data collection tools as "devices used to collect data such as tests, structured interview schedules, and checklists." There are different types of research instruments such as questionnaires, checklists, distributions, interviews, observations, records, and experimental approaches. A questionnaire is one of the most common research instruments for gathering information from research subjects about their perceptions, attitudes, knowledge, beliefs, and feelings towards a particular topic of the study. The study collected both primary and secondary data. The secondary data was the revenue collection records for the period January 2019 to December 2023. The records contained the following information; the name of the forestry station, the source of revenue, and the amount collected. Additionally, the researcher used a questionnaire to collect primary data on the challenges encountered in revenue collection as well as strategies for effective revenue collection. The questionnaire was pretested on a few selected technical and accounts personnel at Department of Forestry Headquarters. The easiness of completion of the questionnaire and ambiguity of questions were noted and subsequently revised before a large-scale interview.

The data for the study was collected through a structured questionnaire, with multiple-choice, open-ended and Likert scale questions. The questionnaire was administered using Google Forms and the link was distributed through

social media play forms such as E-mails, and WhatsApp. The questionnaire was administered in the months of November and December 2023.

2.5 Statistical Analysis

Data collected was analysed to generate descriptive statistics (frequencies/proportions). A three-factor analysis of variance (ANOVA) model (Equation 3) in GenStat 18 was used to determine the significant difference in the performance of revenue collection. Forestry Station, source of revenue, and time in years were considered as fixed effects. Variance components for the sources of variation were also estimated. Furthermore, the Chi-square (X^2) test in SPSS version 25 was used to assess the significant difference among the variables. Chi-square (X^2) test was used because of its ability to analyse enumerative data. The analysis was tested at a 5% significance level. According to Daniel & Cross (2013), conducting the test analysis at 5% significance level helps to strike a balance between being too conventional (e.g., using a 1% level, which might miss potentially meaningful outcomes) and being too generous (e.g., using a 10% level, which might increase the likelihood of finding spurious outcome). The 5% level allows researchers to conduct the analysis with a reasonable level of confidence while minimizing the risk of both Type I and Type II errors.

$$Y_{ijkl} = \mu + F_i + S_j + T_k + (FS)_{ij} + (FT)_{ik} + (ST)_{jk} + (FST)_{ijk} + e_{ijkl,} \ldots \quad (Equation\ \ 3)$$

where:

- Y_{ijk} is the response variable (revenue in Malawi Kwacha) of jth observation in the ith treatments;
- μ is the overall mean;
- F_i is the fixed effect of forestry station (i = 1, 2, 3, …, 8);
- S_j is the fixed effect of source of revenue (j = 1, 2, 3, …, 7);
- T_k is the fixed effect of time in years (j = 1, 2, 3, …, 5);
- $(FS)_{ij}$ is the effect of the interaction between forestry station and source of revenue;
- $(FT)_{ik}$ is the effect of the interaction between forestry station and time;
- $(ST)_{jk}$ is the effect of the interaction between source of revenue and time;
- $(FST)_{ijk}$ is the effect of the interaction between forestry station, source of revenue, and time;
- e_{ijkl} is the random residual effect, e_{ijkl} ~ N(0, σe^2).

3. Results

3.1 The Main Sources of Revenue at Eastern Zone Forestry Stations

A summary of results on the main sources of revenue at Eastern Zone Forestry Stations are presented in Table 1. The results indicate that there are seven main sources of revenue in Eastern Zone Forestry Stations. Furthermore, the results indicates that the sources of revenue significantly (P<0.001) differed. Log sales contributed highest (79.3%) to the total revenue for the past five years followed by Licences fees (6.3%), then firewood sales (5.9%). Transfer conveyance certificates contributed about 5.8% to the total revenue collected. On the other hand, pole sales and shares from co-management were the least, contributing 0.9% and 0.8%, respectively to the total revenue in the past five years.

Table 1 Main Sources of Revenue at Eastern Zone Forestry Stations for the Years 2019 to 2023

No.	Source of Revenue	Revenue (MWK "millions")	Contribution to the Total Revenue (%)
1	Charcoal sales	3.7	1.0
2	Firewood sales	21.0	5.9
3	Government shares from Co-management Block (30%)	2.8	0.8
4	Licence fees	22.6	6.3
5	Log sales	283.4	79.3
6	Pole sales	3.1	0.9
7	Transfer Conveyance Certificate	20.9	5.8
	TOTAL	**357.5**	**100.0**

Note: 1U$D= 1,700MWK as of 1st January 2024 (Source: MCCCI, 2024)

3.2 The Level of Performance in Revenue Collection among the Eastern Zone Forestry Stations

A summary of results on the level of performance in revenue collection among Eastern Zone Forestry Stations are presented in Tables 2 and 3, as well as in Figures 2 and 3. The results indicates that the revenue from different stations significantly (P<0.001) differed. Zomba Mountain Plantation contributed highest (90.2%) to the total revenue collected for the past five years (2019 – 2023). This may be attributed to the log sales.

In addition, using the three factor ANOVA, the results indicates that all the three factors, station, year, and source significantly influenced the total revenue collected (Table 3). Source contributed highest (30.15%) to the total variation, followed by the interaction between station and source (28.05%).

Further analysis, indicates a decline in revenue from almost in all the stations, expect Dzonzi-Mvai Plantation (Figure 2). The results indicates that the revenue for Dzonzi-Mvai increased by 22.5% annually for the past five years (2019-2023). The rest of the stations had the following annual decrease in revenue: Zomba Mountain Plantation 19.4%, Machinga DFO 19.2%, Balaka DFO 18.6%, Nauko Plantation 16.8%, Zomba DFO 12.6%, Mangochi DFO 6.6%, and Ntcheu DFO 2.8%.

Further analysis indicates that the revenue for Eastern Zone Forestry Stations, overall, increased by 70.8% from the year 2019 to the year 2020 (Figure 3). Then, it drastically decreased by 23.8% annually from the year 2020 to the year 2023. The decline from the year 2020 to 2021 may be attributed to the COVID-19 pandemic, since most of the business were at stand still because of the lock down. Overall, the revenue for the Eastern Zone Forestry Stations decreased annually by 18.3% for the past five years (2019 – 2023).

Table 2 Level of Performance in Revenue Collection among Eastern Zone Forestry Stations (2019-2023)

No.	Station	Revenue (MWK "millions")	Contribution to the Total Revenue (%)
1	Balaka DFO	0.8	0.2
2	Dzonzi-Mvai Plantation	5.7	1.6
3	Machinga DFO	2.8	0.8
4	Mangochi DFO	6.1	1.7
5	Nauko Plantation	3.1	0.9
6	Ntcheu DFO	8.2	2.3
7	Zomba DFO	8.2	2.3
8	Zomba Mountain Plantation	322.6	90.2
	TOTAL	**357.5**	**100.0**

Note: 1U$D= 1,700MWK as of 1st January 2024 (Source: MCCCI, 2024)

Table 3 Variance Components for the Revenue Collected at Eastern Zone Forestry Stations (2019-2023)

Source of Variation	*df*	*P*-value	Variance (%)
Station	7	<0.001	12.95
Year	4	0.002	1.97
Source	6	<0.001	30.15
Station∗Year	28	<0.001	8.39
Station∗Source	42	<0.001	28.05
Year∗Source	24	<0.001	16.51
Station∗Year∗Source	168	0.500	1.97
Residual			0.02

df: degree of freedom

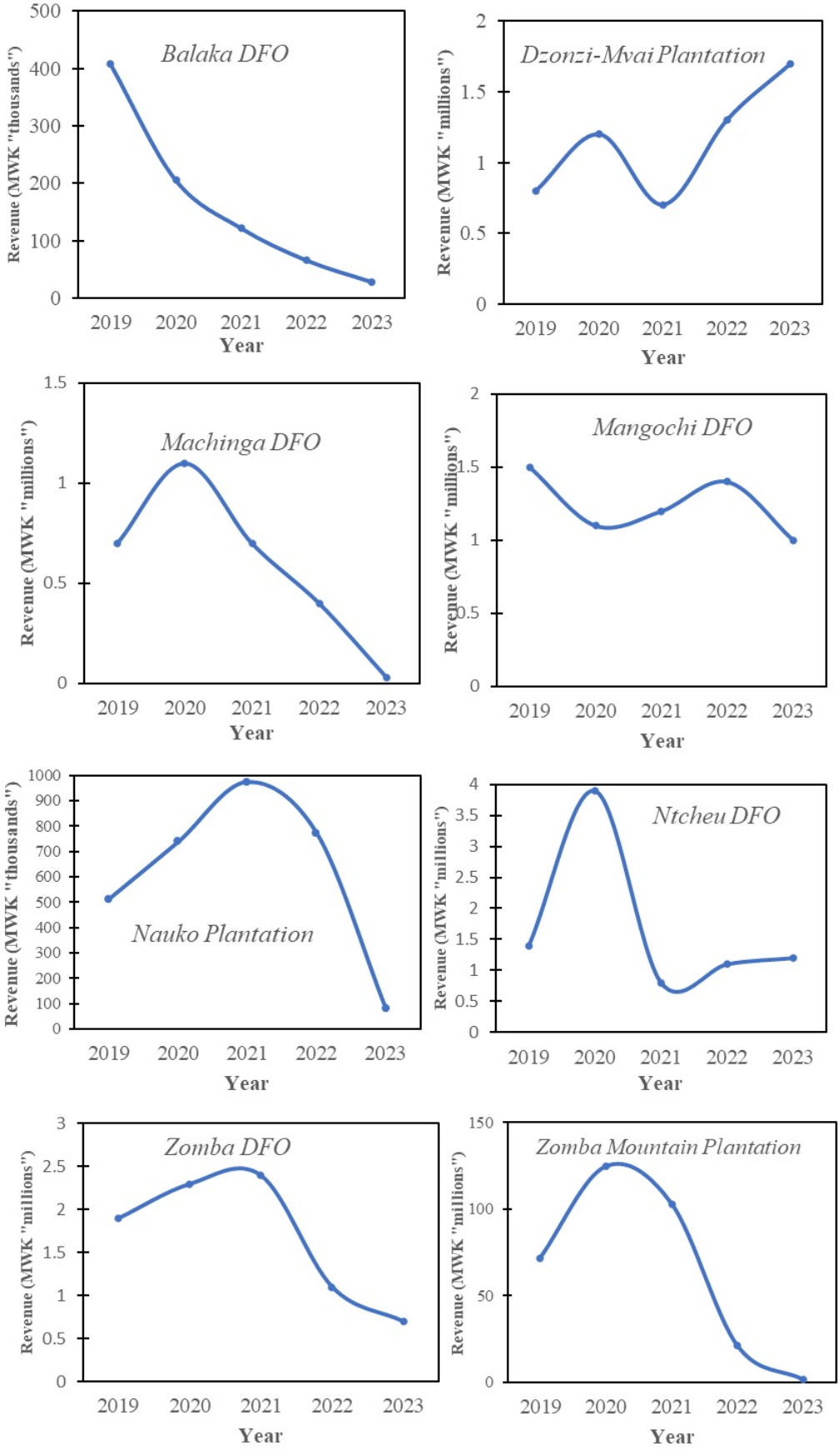

Figure 2 Revenue Trends for Different Stations for Eastern Zone Forestry from the Year 2019 to 2023

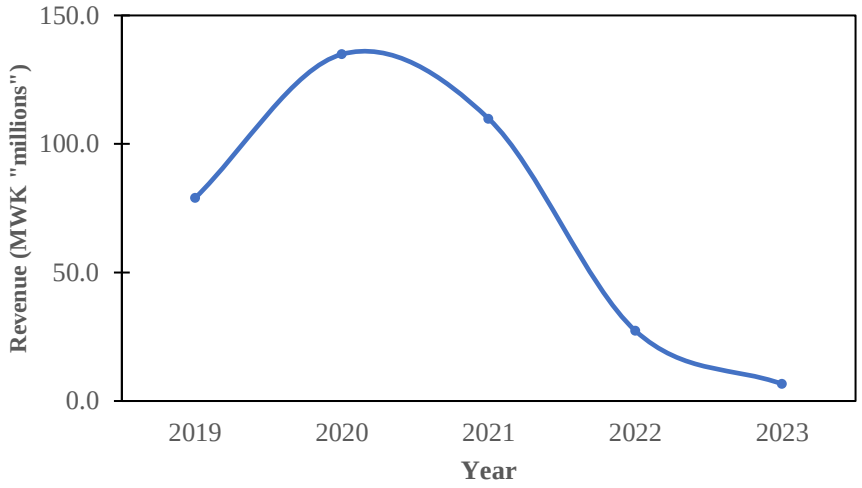

Figure 3, Overall Revenue Trend for Eastern Zone Forestry Stations from the Year 2019 to 2023

3.3 Social Demographic Characteristics of Respondents

The majority (73.5%) of the respondents were male, and most (40.8%) of the respondents fell within the age bracket of greater than 40 years. This indicates that most of forestry activities are conducted by male. Majority (87.8%) of the respondents were forestry officers, and most of them (61.2%) had a work experience of more than 5 years. This implies that majority of the respondent had knowledge, skills and experience in forestry activities including revenue collection. The responded were almost equally distributed in all the forestry station offices (Table 4).

Table 4, Socio-Demographic Characteristics of Respondents

Variable	Frequency	Percentage
Work Category		
Forestry Officer	43	87.8
Accounts Personnel	3	6.1
Internship	3	6.1
Gender		
Female	13	26.5
Male	36	73.5
Age (Years)		
≤19	0	0.0
20 – 29	10	20.4
30 - 39	19	38.8
≥40	20	40.8
Work Experience (Years)		
≤5	19	38.8
6 – 10	4	8.2
11 - 14	9	18.4
≥15	17	34.7
Work Station		
DoF Headquarters	3	6.1
Zone Forestry Office-East	7	14.3
Balaka DFO	7	14.3
Machinga DFO	3	6.1
Mangochi DFO	5	10.2
Ntcheu DFO	6	12.2
Zomba DFO	5	10.2
Dzonzi-Mvai Plantation	4	8.2
Nauko Planation	3	6.1
Zomba Mountain Plantation	6	12.2

3.5 Challenges Encountered in Revenue Collection at Eastern Zone Forestry Stations

A summary of the results on the challenges encountered in revenue collection at Eastern Zone Forestry Stations are presented in Figure 4. There were significant (X^2=47.68; P<0.001) differences in the identified challenges. Insufficient staff and poorly skilled revenue staff (83.6%), inadequate supervision and monitoring of revenue generation (67.4%), and lack of capacity to enforce compliance (61.2%) were identified as the major challenges encountered in revenue collection at Eastern Zone Forestry Stations. Other factors identified include poor revenue forecast and planning, inadequate fixed fee receipts, and inadequate General Receipts books.

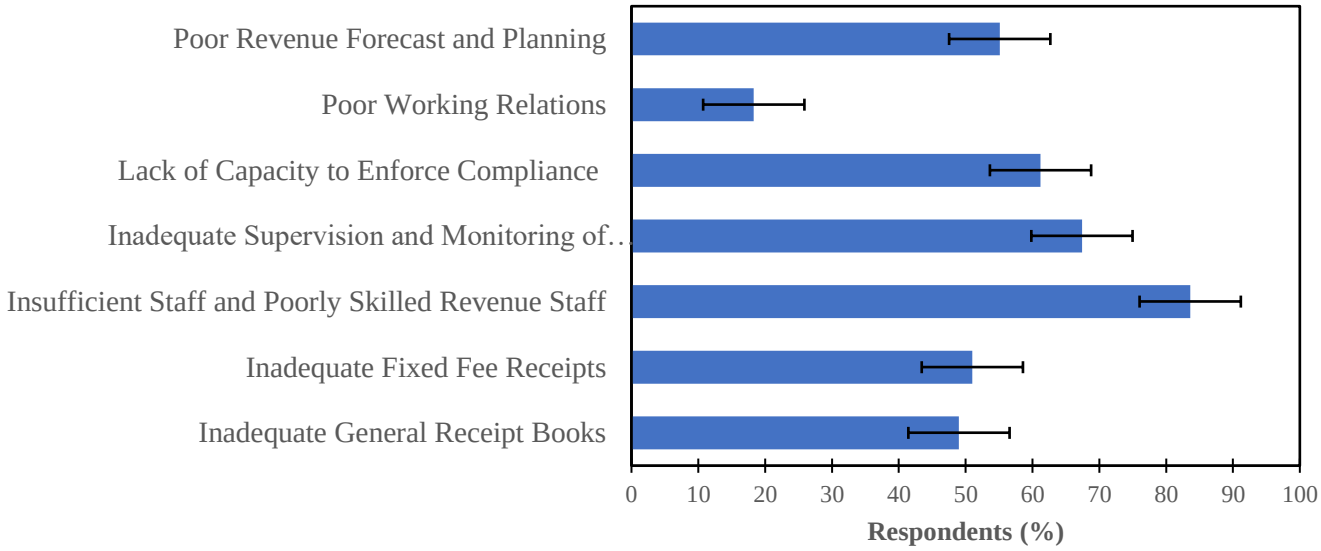

Figure 4, Challenges Encountered in Revenue Collection at Eastern Zone Forestry Stations (X^2=47.68; df=6; P<0.001)

3.6 Strategies for Effective Revenue Collection at Eastern Zone Forestry Stations

A summary of the results on the strategies for effective revenue collection at Eastern Zone Forestry Stations are presented in Figure 5. There were significant (X^2=27.98; P<0.001) differences in the suggested strategies. The major strategies suggested were: capacity building of those handling revenue (100%), robust supervision and monitoring of revenue generation (100%), development and implementation of revenue enhancement plan (96%), and effective enforcement (95.9%).

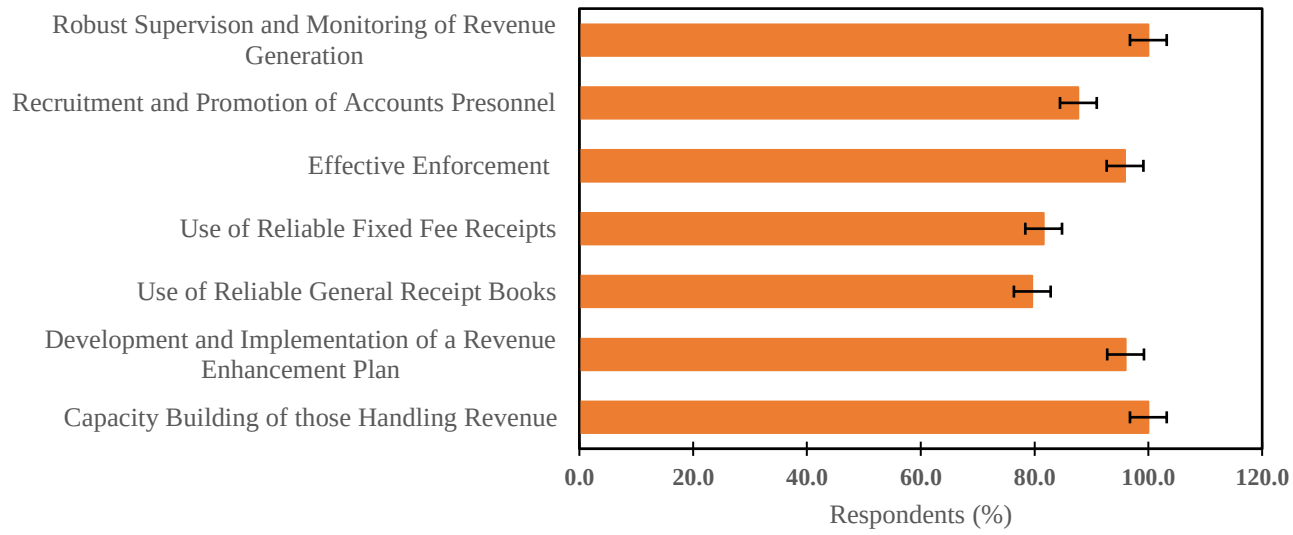

Figure 5, Strategies for Effective Revenue Collection at Eastern Zone Forestry Stations (X^2=27.98; df=6; P<0.001)

4. Discussion

4.1 The Main Sources of Revenue at Eastern Zone Forestry Stations

Numerous studies have reported about the main sources of government revenue in various countries and various government institutions (Kopanji, 2015; Kelly et al, 2017; Seatini & Kiwepi, 2017). The present findings agree with those reported by other researchers (Seatini & Kiwepi, 2017; Kopanji, 2015; Kelly et al, 2017; Paudel & Paudel, 2021). They all reported significant differences in sources of government revenue in various countries and various government institutions.

Kelly *et al*. (2017) and Harper *et al.* (2023) reported that forestry revenue sources vary due to diverse uses of forests. Timber sales contribute significantly, but factors like location, forest type, and management practices shape revenue streams. For some, eco-tourism or carbon credits provide income, while others focus on non-timber forest products like nuts, fruits, or medicinal plants. Variations in market demand, government policies, and environmental considerations further influence revenue sources in forestry.

Additionally, Kopanji (2015) and MNRT (2021) reported that government revenue collection in forestry primary stems from various sources such as timber sales, forest leases and concessions, royalties and taxes, and permits and licenses. However, he stated that timber sales contribute significantly to the revenue in forestry sector. This is due to high demand for wood products. Wood is a versatile raw material used in construction, furniture making, paper production, and various industries. The demand for timber remains consistently high, driving revenue from its sale (Seatini & Kiwepi, 2017; Jacob & Nelson, 2021). Moreover, timber sales provide a consistent and substantial source of income for governments involved in the forestry sector due to the perpetual demand for wood products and the controlled management of forest resources (Martin, 2014; Chang *et al.* 2019; Hoare & Uehara, 2022).

4.2 The Level of Performance in Revenue Collection among Eastern Zone Forestry Stations

Several researchers have reported on the level of performance in revenue collection in government forestry institutions and councils (Prashad *et al*., 2021; Poudyal *et al*., 2020). The present findings agree with those reported by other researchers (Prashad *et al*., 2021; Poudyal *et al*., 2020). They all reported significant increase and decrease in government revenue in various countries and various government forestry institutions.

Prashad *et al*. (2021) reported that the revenue performance of forestry government institutions post-COVID-19 has varied across regions due to differing impacts on industries and economies. Generally, there have been mixed outcomes. Some regions experienced increased demand for timber and related products due to home improvement and construction activities, resulting in stable or improved revenues. However, other areas faced challenges due to disrupted supply chains, reduced commercial activities, and conservation efforts, impacting revenue negatively. Adoption of digital platforms, innovative forestry practices, and policy adjustments have been pivotal in navigating these fluctuations (Poudyal *et al*., 2020).

Generally, the significance of changes in revenue collection in the forestry sector extends beyond financial implications, impacting environmental sustainability, social development, technological advancements, and global competitiveness. Maintaining or improving revenue streams is crucial for balanced economic growth, environmental preservation, and social welfare (Poudyal *et al*., 2020).

4.3 The Challenges Encountered in Revenue Collection at Eastern Zone Forestry Stations

A number of studies have reported on the challenges encountered in revenue collection in government forestry institutions and councils (Kopanji, 2015; SDS & USAID, 2016). The present findings are in line with those reported elsewhere (Kopanji, 2015; SDS & USAID, 2016; Seatini & Kiwepi, 2017; Jacob & Nelson, 2021). Seatini and Kiwepi (2017) and Chiari (2024) reported the following as challenges encountered in government revenue collection: inadequate tax registers and data banks, insufficient financial support for investments in local revenue generation, insufficient staff and poorly skilled revenue staff; Central Government (CG) defaulting to pay taxes on its properties, inadequate supervision and monitoring on revenue generation, lack of capacity to enforce compliance, high cost of property valuation, poor working relations, and leaders not leading by good examples.

In addition, Kopanji (2015) and Torslov *et al.* (2023) urged that revenue collection in government councils and institutions faces various challenges, such as: Tax Evasion and Avoidance, some individuals or businesses may find loopholes or engage in evasion practices, reducing the revenue stream. Inadequate Infrastructure, outdated or inef-

ficient collection systems hinder the process, leading to delays, errors, or loss of revenue. Furthermore, mismanagement, bribery, or embezzlement within institutions can divert funds away from intended purposes is also considered as one of the challenges encountered in revenue collection. Additionally, inadequate awareness or understanding of tax laws or regulations can lead to non-compliance and reduced revenue, and insufficient technology or outdated systems may hinder efficient collection processes (Paudel & Paudel, 2023; Kuncoro & Cahyani, 2018; Oliveira *et al*., 2018; Nuluva, 2015; Opuku *et al*., 2014).

Additionally, revenue collection in the government forestry sector faces several challenges as outlined by SDS & USAID (2016). Weak enforcement mechanisms and lack of compliance with forestry regulations hinder effective revenue collection, and insufficient monitoring leads to revenue leakage. Moreover, corruption within the system can result in revenue loss through bribery, fraudulent practices, or misappropriate of funds intended for forestry revenue. Furthermore, limited technology infrastructure for monitoring and tracking timber sales, along with outdated payment systems, can impede efficient revenue collection. Also, insufficiently trained personnel, both in forest management and revenue collection, can lead to errors, inefficiencies, and difficulties in enforcing regulations. Besides, economic conditions, poverty, and lack of alternative livelihoods in forest-dependent communities might drive illegal activities, impacting revenue collection efforts. In addition, striking a balance between conservation efforts and revenue generation often poses a challenge. Strick conservation measures might limit revenue streams, while excessive exploitation could harm the environment (Chikwede, 2022; UNECE, 2021; Nuluva, 2015; Opuku *et al*., 2014).

4.4 The Strategies for Effective Revenue Collection at Eastern Zone Forestry Stations

Many researchers have reported on the effective revenue collection in forestry sector (DAFM, 2023; Karsenty & Salau, 2023; NTEP, 2023; Chikwede, 2022; Verhoeven *et al*., 2019; Kopanji, 2015; Uremadu, 2014; Martin, 2014). The present findings are in line with those reported elsewhere (Kopanji, 2015; Uremadu, 2014; Martin, 2014). Uremadu (2014) reported that effective revenue collection in government councils and institutions involves various strategies: transparent taxation, streamlined processes, and education and awareness. Additionally, implement strict penalties for non-compliance while ensuring due process. This acts as a deterrent and encourages compliance (IBRD, 2021; Maloney, 2021; FAJ, 2019; Kopanji, 2015). Similarly, Naitram (2022) and Uremadu (2014) explains that collaboration and information sharing is one of the strategies for effective revenue collection. Thus, collaboration with other agencies or jurisdictions to share information on taxpayers and enhance enforcement capabilities. In conclusion, combining these approaches can lead to a more robust revenue collection system for government councils and institutions (Fuest *et al*., 2022; DTIC, 2020; Martin, 2014; Agyapong, 2015).

Furthermore, strengthening monitoring mechanisms to track timber harvesting, logging activities, and ensuring strict enforcement of regulations to prevent illegal logging and unauthorized forest exploitation can improve revenue collection in government revenue collection. In addition, establishing transparent fee structures for permits, licenses, and timber extraction, ensuring clarity in payment processes, and publicizing these structures to stakeholders, can also improve revenue collection in government forestry sector (Hansen & Lund, 2018; Martin, 2014). Besides, implementing technological solutions such as satellite monitoring, digital tracking systems, and online payment platforms to enhance efficiency, accuracy, and transparency in revenue collection, can also improve revenue collection in government forestry sector. Moreover, providing adequate training and capacity building for personnel involved in forestry management and revenue collection to improve their skills and knowledge base, can also improve revenue collection in government forestry sector (Naitram, 2022; Uremadu, 2014; Berman, 2017).

Additionally, involving local communities in forest management, providing incentives for sustainable practices, and ensuring they benefit from revenue generated, thereby reducing illegal activities can also improve revenue collection in government forestry sector. Also, forming partnerships with private entities, international organizations, and other stakeholders to improve revenue collection mechanisms, share resources, and implement best practices, can also improve revenue collection in government forestry sector. Furthermore, developing and implementing robust governance structures, policies, and regulations that promote sustainable forestry practices and effective revenue collection, can also improve revenue collection in government forestry sector. Besides, implementing measures to curb corruption and promote transparency, such as independent audits, whistleblower protections, and strict penalties for fraudulent activities, can also improve revenue collection in government forestry sector. Finally, conducting awareness campaigns among stakeholders, communities, and industries about the importance of sustainable forestry practices and the consequences of illegal activities, can also improve revenue collection in government forestry sector (Garcia-Bernardo & Janský, 2023; Kopanji, 2015).

5. Conclusions

The study has revealed seven main sources of revenue collection at Eastern Zone Forestry Stations. The main sources of revenue collection identified are charcoal sales, firewood sales, shares from co-management block, licence fees, log sales, pole sales, and transfer conveyance certificates. It was noted that log sales contributed the highest to the total revenue collected for the period of five years, while shares from co-management contributed the least. Furthermore, the study revealed that Zomba Mountain plantation contributed the highest to the total revenue collected among the forestry stations, while Balaka DFO contributed the least. The study further revealed a decline in revenue collection for a period of the past five years from all the stations, expect Dzonzi-Mvai Plantation, which showed an annual increase. Insufficient staff and poorly skilled revenue staff, inadequate supervision and monitoring of revenue generation, and lack of capacity to enforce compliance were identified as the major challenges encountered in revenue collection at Eastern Zone Forestry Stations. The study further revealed the following as strategies for effective revenue collection: capacity building of those handling revenue, robust supervision and monitoring of revenue generation, development and implementation of revenue enhancement plan, and effective enforcement.

6.0 Recommendations and Areas of Further Study

Basing on the present findings, the study recommends the following key strategies for effective revenue collection in forestry and governmental institutions: Establish clear and transparent revenue collection policies, outlining fees, taxes, and procedures. Clarity helps in compliance and reduces disputes. Secondly, utilize technology for efficient data collection, monitoring, and payment processes. This might involve digital platforms for payments, remote sensing for forestry monitoring, and database systems for tracking revenue. Thirdly, train staff on efficient revenue collection methods and provide them with necessary tools and resources. A well-trained team can enhance collection accuracy. Fourthly, educate the public about the importance of paying dues and taxes and how these funds contribute to sustainable forestry management and public services. Engaging stakeholders builds support for compliance. Fifthly, implement strong enforcement mechanisms to deter defaulters and ensure compliance. This might include penalties for non-payment or illegal forestry activities. Finally, but not least foster partnerships with relevant stakeholders, such as NGOs, private sector entities, and international organizations, to leverage expertise and resources for effective revenue collection strategies. Finally, conduct regular audits to identify gaps or inefficiencies in revenue collection processes and make necessary adjustments to improve performance. Implementing a combination of these strategies tailored to the specific context of forestry and governmental institutions can significantly improve revenue collection efficiency and effectiveness.

The study was only limited to the performance on government revenue collection at Eastern Zone Forestry Stations. However, any interested forestry or government institution can use it as a bench mark. Further studies should also be conducted for other forestry zone stations. Future studies should also consider the following areas that arise from this study:

(i) Exploring how emerging technology like blockchain, Artificial Intelligence, or satellite imagery could enhance revenue tracking, transparency, and fraud detection in forestry revenue collection.
(ii) Exploring methodologies to accurately value forest resources, including timber, ecosystem services, and biodiversity, to ensure appropriate pricing and revenue collection mechanisms.
(iii) Conducting comparative studies across different regions or countries to identify successful models or practices in revenue collection for sustainable forest management and their adaptability elsewhere.
(iv) Researching the potential impacts of climate change on forestry resources and how this might affect revenue collection strategies and adaptation measures.

Data Availability Statement: The data that support the findings of this study can be obtained from the corresponding author upon request.

Disclaimer (Artificial intelligence)

Authors hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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