

Exploring and Developing Instruments for Measuring Organizational Development in Waste Management Industry

Isiaka Ilori Bolaji

Faculty of Business and Management, Universiti Sultan Zainal Abidin, Terengganu, Malaysia

Fakhrul Anwar Zainol*

Faculty of Business and Management, Universiti Sultan Zainal Abidin, Terengganu, Malaysia

[*Corresponding author]

Zainudin Awang

Faculty of Business and Management, Universiti Sultan Zainal Abidin, Terengganu, Malaysia

Abstract

There are still limiting factors in achieving success in organizational development, despite various studies that have demonstrated the beneficial effects and ways of achieving OD through the assessment of strategies in various studies. To address these issues, the researchers conducted empirical studies highlighting numerous crucial measures to consider for success. To assess the measurement tools through the assessment of reliability and validity, this study utilized exploratory factor analysis and a structured self-administered questionnaire. Data from 190 waste management contractors were collected through the pilot study which covered Lagos State, Ogun, Oyo, Osun, Ondo and Ekiti. Employ stratified random sample to enable each state to participate in research and analyzed using a statistical package for social science, 26.0. At the first stage, 15 items were developed to measure OD constructs, but after EFA, 14 items with factor loadings above 0.60 were retained. The components have been redesignated as OD-dumpsite, OD-recycling, OD-training, and OD-financial performance. A total of 84.075% of the variance was explained by the factors falling within these four categories. Cronbach Alpha (α) for all constructs is 0.890, while Cronbach Alpha for each construct ranged from 0.718 to 0.882. The research validates the measurement tool through a framework crucial for the waste management industry. The finding provides a reliable instrument for assessing OD in the context of waste management agencies, and private sector participants. To improve organizational performance in Nigeria's waste management sector, framework provides implications for further study.

Keywords

Organizational development, Exploratory factor analysis, Validity, Southwest Nigeria, Waste management industry

INTRODUCTION

An estimated 32 million tonnes of solid garbage are produced in Nigeria annually of which approximately 20–30% are collected and treated, and the remaining 70% of garbage is burned or disposed of in an unauthorised manner, increasing pollution and health hazards (Aderemi et al., 2020). The issue of the management of solid waste in modern life is complicated. Despite several legislation and regulations, the management of solid waste is becoming increasingly problematic for both urban and rural parts of Nigeria. This environmental dilemma is becoming more urgent by the day (Alao et al., 2023). In the fast-paced waste management organization world of today, organizational development (OD) is essential to achieve a competitive advantage (Mannion et al., 2023).

An organization's success or failure is closely linked to the dedication and effective management of landfills, availability of recycling facilities, employee training and financial performance. Therefore, we must consider tools for measuring organizational development. Many organizations identified with low performance because of a lack of resources and support. Over the last two decades, organizational performance, organizational effectiveness and organizational development have been the centre of attention for several research projects: The role of organizational commitment and leader exchange (Ishak et al., 2023), organizational support and employee development (Jehanzeb,

2020), enhanced treatment of landfill leachate wastewater (Asaithambi et al., 2020), assessment of solid waste management (Aderemi et al., 2020).

Several developed and developing countries such as the UK, USA, Germany, and Asia have used the opportunity to waste resources such as reducing, reusing, and recycling (3R) to improve environmental development and achieve economic growth (Jacobsen et al., 2022). A strategic instrument for raising an organization's services, resilience, and efficiency is organizational development. Ishak et al. (2023), posit that OD entails a range of initiatives to improve output, foster a positive change, and culture, foster advancement, and support (Ritchie et al., 2023; Joo et al., 2023).

However, in guaranteeing the efficacy, efficiency, and extended viability of services rendered by waste management agencies and private sector participants (PSPs) in south-west Nigeria. Hence, organizational development is needed. Despite a huge of money spent by the government, stakeholders' efforts, contractors, and policymakers' combined efforts to address garbage disposal in achieving OD (Banso et al., 2023). All these efforts have not yielded results because of limited tools to measure organizational development in achieving organizational goals and objectives.

Therefore, the challenges are not yet addressed. Previous studies emphasized the problem of careless waste disposal has grown dramatically (Sylvester & Ikudayisi, 2021). Regardless of one's social or economic standing or where they live geographically, humans are compelled by nature to produce waste in a variety of forms, including gas, liquid, and solid (Monday & Sunday, 2019).

Therefore, organizational development is a concern. In recent literature, Laser (2022), offers a modern viewpoint in this area of organizational development in waste management which is the examination and use of diverse protocols, structures, and approaches to impact and enable organizational change. The goal is to influence organization or group transformation to enhance performance. Similarly, Jahanzeb (2020), designates a source that advances knowledge of the idea that organizational effectiveness is evaluating and improving an organization's ability to achieve its objectives. The focus of organizational effectiveness, as opposed to organizational development, concentrates on promoting change but acts as a gauge for the effectiveness of the organization and its capacity to provide the intended results. Consequently, organizational performance refers to a collection of practices and analytical instruments that are included in the management of business performance. Ensuring that an organization's operations and results are in line with its goals and activities is the main objective of organizational performance management (Rehman & Iqbal 2020).

At this point organizational performance, effectiveness and organizational development are intertwined, failure to achieve one would affect the other. In summary, these ideas offer various viewpoints on running and enhancing organizational development entails controlling activities to be in line with goals, organizational effectiveness assesses goal achievement, and organizational development concentrates on promoting change. Every idea advances our knowledge to help us apply efficient organizational management techniques. Above all none of this previous literature has ever found an instrument to measure organizational development.

In the context of Southwest management claims experienced issues with burning rubbish in places not approved for burning, careless disposal of waste, and poor management of waste production, despite the advantages that trash recycling and reuse methods for the benefit of the environment, society, and economy (OECD, 2019; Ayçin & Kayapinar, 2021). This is useful for sustainability development rather, tends to bring more challenges in failure to commit to sustainable development. Sustainable development and waste management are coined (Omosanya, 2019).

The Southwest Garbage Management Organization faces challenges due to excessive workloads, poorly maintained landfills, and inadequately managed garbage disposal facilities. These issues are getting worse every day, the persistent problems of fast population growth and inadequate planning have not only had an impact on the volume of solid waste but have also rendered solid waste management techniques unable to keep up with the rate of generation (Aderemi et al., 2020). South-west Nigeria's waste management methods have not yet achieved sustainable development growth. Although the Nigerian government has created a national strategy on the environment, it primarily addresses Nigeria's commitment to reaching sustainable development goals and how the nation plans to do so. But the actual situation shows otherwise (Salami et al., 2019).

It is Lagos state in southwest Nigeria using strategy to meet up with the sustainable agenda in achieving organizational development, but still facing logistics challenges such as dumpsites, recycling facilities, non-payment services rendered by users, inadequate staff, financial performance, and leadership commitment. Moreover, another main issue limiting the waste-management industry to attaining organizational development is inadequate funds. The lack of funds is to blame for several issues, including the inability to buy new garbage collection vehicles, and inadequate cars for employees for official functions (Sylvester & Ikudayisi, 2021).

The number of evacuators in some states in southwest Nigeria to waste generation in the state, it is glaring that defects in waste management have a significant effect on organizational development. The number of staff apart from contractors is also having a shortfall in running the daily administrative functions effectively (Aderemi et al., 2020). In addition, weak legislation, and policy implementation: Solid-waste management policies lack constitutional strength and are not well-executed. Additionally, there is little monitoring of this policy's application and evaluation (Banso et al., 2023).

Furthermore, to address all the above organizational development problems in south waste management, numerous tools and techniques have been created to aid with this process; two essential tools are exploratory factor analysis (EFA) and Reliability Analysis (Saikang et al., 2023; Dehisat & Awang, 2020; Khan et al., 2019). Traditional methods of measuring organizational development or performance are not trusted since they frequently conceal the

organization's actual state. Previous studies stated that the nonparametric method should not be used to measure organizational development or performance since they do not provide a comprehensive view of the evaluation and allow for further research (Sule et al., 2022). The parametric, such as EFA, were established in response to the flaws of the old approach.

Therefore, organizational development is a tool that focuses on improving an organization's capacity through the alignment of strategy, structure, and management processes to attain organizational objectives. The purpose of this study is to investigate how EFA and Reliability Analysis might be used to better understand the organizational development, organizational performance or organizational effectiveness of government agencies and PSPs engaging in the Waste Management industry in south-west Nigeria. Furthermore, the study aims to evaluate a multidimensional instrument for measuring organizational development. The instrument items were adapted from previous literature and were modified to ensure they met the objectives of this investigation (Das & Hassan, 2022; Rawashdeh & Tamimi, 2020; Ishak et al., 2023). The instrument's pass-through face validity, criteria validity, and content validity were examined in compliance with recommendations (Awang et al., 2023 pp.174).

The validity and reliability were verified using the exploratory factor analysis (EFA). The study goals are:

- i. To assess the validity of the organizational development (OD) construct using the waste management contractor's and agencies' instruments
- ii. To assess the reliability of the waste management businesses organizational development organization (OD) among waste contractors and agencies.
- iii. To develop the framework in contribution to the theoretical gap due to limited research in the previous literature on organizational development.
- iv. Another contribution to serves as a value-added is the methodology said by Mohamed et al. (2023) that feedback from respondents through online questionnaires is hard to come by. Therefore, future studies should consider giving the questionnaire in person. Therefore, this study is hereby answered the call.

The study first proposed the objective is validity, comprised of the descriptive statistic table that shows the statistical response of the respondents, Principal component analysis: Kaiser-Meyer-Olkin (KMO) and Bartlett's Test, component matrix emerges through rotation and varimax of the new components and second is the reliability of the instruments comprised of each construct Cronbach's Alpha and all construct Cronbach's alpha. All these depict of validity and reliability of the study are presented in the table centre below [1-4] and figure [1-2].

LITERATURE REVIEW

Organizational Development

Organizational development entails controlling activities to be in line with goals through effectiveness, assessing goal achievement, and concentrating on promoting change. OD is an effort made for effective management of dumpsites for accessibility by compactors and taking advantage of sustainability to achieve better environmental conservation for future waste generation (Pellegrini et al., 2020); Gong & Ribiere, 2021); Edeh et al., 2023). The term organizational development refers to individual organizations improving capacity building to meet global ideas with adequate personnel, increasing organizational effectiveness and tools to measure financial performance. Tools measure and manage strategies in the organization's 'processes' using behavioral science knowledge (Supriharyanti & Sukoco, 2023). Several disciplines, including psychology, sociology, and management theory, are the foundation of OD (Pellegrini et al., 2020).

However, the significant event forced waste management organizations to pursue organizational development measures to meet up with daily activities. As described above organizational development has been viewed by different scholars who employed different techniques through reviewed and non-parametric tools in achieving organizational performance and organizational effectiveness without realizing the objective (Ogbu et al., 2022; Aderemi et al., 2020; Salami et al., 2019). The only literature that applied parametric in solving organizational development in waste management is Okosun et al. (2021), who employed only the demography statistics of the respondents without theory.

The demography would give the characteristics of the respondents such as female, male, age, education, experience, and area covered. This can not only address the issue as a parametric tool to solve the problem it can only identify the result of responses. However, tools like EFA involved constructs and all the items in solving the problem and identifying those items that cannot withstand the analysis through dimension reduction factors or principal component analysis (PCA) and factor loading greater than 0.6 emerged known as EFA (Table 3 below). This result would also give ways for further analysis (Awang et al., 2023).

Moreover, previous literature failed because of failure to apply theories (Mohameda et al., 2023; Sylvester & Ikudayisi, 2021). The theory is important in waste organizational development due to its empirical. The functions of theories include assisting in the formulation of a research question, directing the selection of pertinent data, interpreting the data, and offering explanations for the underlying causes or influences of events that are seen (Pinto, 2022; Montag et al., 2020). Furthermore, this study integrates culture theory, there are four types of corporate culture theory, such Clan culture, Adhocracy, hierarchy and Market culture theory, the theory that theorized south-west waste management organizations due to its inability to meet with the global trend in organizational development towards sustainability is corporate culture or market culture (Belk et al., 2022; Massi et al., 2021; Paul, 2020). The Market culture emphasizes that failure to achieve adequate management like accessibility to dumpsites and acquiring modern tools like facilities for recycling, adequate financial performance, and adequate personnel would not be able to compete with other waste

management organizations in the world. Finally, organizational development is a tool that focuses on the improvement of organizational capabilities and alignment of strategy, structure, integration of theory and management process to meet future waste generation.

Organizational development dumpsite

A dumpsite is a plot of land developed and dedicated to the disposal of trash, in contrast, dump sites include waste dumps, rubbish dumps, trash dumps, and waste yards. This includes every different kind of waste, domestic waste, commercial waste, agricultural waste, etc. In general, a dumpsite can be defined as a place that is authorized to dump all daily waste generated from a particular city or organization (Alao et al., 2023). Moreover, a dumpsite is a place for discarding rubbish either on land or in the water. The disposal of trash in our canals must end, and the attempts to stop rubbish from being dumped into rivers to avoid environmental pollution through effective policy by policymakers (Oliveira et al., 2021). There are environmental effects when the trash is disposed of on open land, the habitants living in such areas close to water, and the source might also contaminate the body of water or groundwater.

This occurs when untreated trash is dumped directly into open landfills or rivers, lakes, and seas, it builds up in the food chain and is ingested by plants and animals (Lissah et al., 2021). On the other hand, Landfills or Environmental Landfills fall into three major categories: Hazardous waste dumps, industrial waste landfills, and municipal solid waste landfills (HIMs). There are bad odours that are always spread via open dumping, open dumping gives germs, insects, and other vectors a place to develop and spread a variety of health issues. Open dumping takes up a lot of unnecessary space and contaminates groundwater (Agbeshie et al., 2020).

Consequently, the waste discarded at the landfill is not waste except we allowed it to be wasted. These are potential resources if the waste management agencies with the support of leadership like governors, policymakers and other stakeholders collaborate with financial support to divert all refuse to recycle centres to ensure reduction and reuse techniques for efficient garbage disposal to attain organizational development (Kabirifar et al., 2020). The only refuse that goes to dumpsites is scrapped when about 99% of waste generation is recycled and 1% goes to dumpsites. This would reduce carbon emission produced by garbage compactors, saving the cost of diesel and time spent on queuing at the landfill and increasing turnaround time for both waste management agencies on waste evacuations. Therefore, a dump site is a place that accommodates scrapped or residual waste after recycling potential resources this method gives an expanded life span to the dump site (Asaithambi et al., 2020; Omosanya, 2019). In addition, when places like households, markets offices, and companies, garages are being swept and no places to be discharged organizational development in waste management tends to be a problem that can lead to diseases, cholera, and environmental degradation (Yaqub, 2023).

Organizational development-recycling

Recycling is the process of creating new materials and items out of garbage, and the recovery of energy from waste products is frequently included in this idea (Di et al., 2021). Recyclability is the capacity of a substance to regain the characteristics that it possessed when it was first created. On the other hand, every day the number of recyclers increases in developed countries. This lessens the need for landfills and other expensive disposal methods. Recycling also lessens the requirement for raw material extraction mining, quarrying, logging refining, and processing all of which significantly contaminate the air and water.

Recycling is the way of gathering and handling materials or used items that are about to be thrown away to create things that can be reused for example, Paper materials, glass bottles, soda cans, and various types of plastic must be recycled by law (Khan et al., 2021). These have been achieved by developed and some developing countries for converting waste resources for business achievement through environmental sustainability in a new era, countries such as the USA, UK, Asia, Germany, Finland etc., have achieved in converted waste produced to supply energy (Kwarteng et al., 2022; Khan et al., 2021). This can be achieved in southwest waste management organizations when the policymakers establish the law, implement the law and financial support to acquire recycling facilities and collaborate efforts with waste contractors (Vegter et al., 2020).

Organizational development- training

This is a reference to methods by which workers can progress in their jobs by acquiring new abilities and professional knowledge through training and development programs provided by the organization to achieve organizational development in waste management (Shani & Noumair, 2021). Training fosters cooperation and teamwork, which in turn leads to safety because of training and progress for improvement. Ongoing education and training make sure that waste contractors and staff members have the know-how to perform the tasks safely (Lei et al., 2020). There are stages of training, a good training process starts well in advance of a trainer's particular instruction and continues long after the session is over. Five connected stages or activities can be seen as parts of the training process; assessment, motivation, design, delivery, and evaluation to achieve organizational development (Mihardjo et al., 2020).

The organization will start to face challenges to improve when there is no measure or evaluation in the organizational system through training. Training will create new knowledge to achieve organizational development. Therefore, when the waste contractors and staff of waste management agencies are well equipped in terms of new knowledge it would be very easy to attain organizational development (Bennell et al., 2021).

Organizational Development- Financial Performance

An organizational financial success is a subjective indicator of its ability to generate revenue and use resources from its primary business activity. The expression is commonly employed to depict the overall condition of organizational finance throughout a specific time frame (Baah et al., 2020). In other words, organizational financial performance is a financial success that is determined by analysts looking at its equity, profitability, revenue, expenses, liabilities, and assets (Garcia & Orsato, 2020). The financial statements of the organization are thoroughly examined, and the Income Statement, Cash Flow Statement, Balance Sheet, and Annual Report of an organization are all reviewed.

However, despite that waste management agencies are not profit organizations, the waste contractors (PSPs) would need to examine if the revenue generated in coverage meets up with the expenses incurred. Likewise, the auditor would come to the waste management agency quarterly to check the all-accounting records if funds allocated to the agency are utilized for being budgeted for (Hutahayan, 2020; Al Farooque et al., 2020).

Therefore, a financially sound business will keep its credit score high and pay its debts on schedule in running the business. Financial performance metrics analysis can be used to find internal investment possibilities, such as automating tedious tasks to boost efficiency, and can assist in maintaining a healthy cash flow in the waste management industry (Ahmed et al., 2022). There are some variables affecting organizational performance including manager ownership, blockholder ownership, firm size, age, liquidity, and leverage, which influence financial performance (Al Farooque et al., 2020).

The main factor affecting financial performance is leverage, which arises when a company attempting to carry out a specific project borrows a significant amount of money but is unable to repay the debt. Organizational development would be difficult to achieve if blockhole owners in waste management agencies who are the governors and policymakers unwilling to acquire recycling facilities, support without enough capital (Tien et al., 2020). To achieve organizational development both waste management agencies and PSPs, would be overwhelmed with waste evacuation through waste generated daily by individuals in various states need huge support for modern technology due to underutilization to evacuate waste without recycling facilities which may lead to environmental degradation, pollution, indiscriminate dumping, and diseases (Ezeudu & Chukwudubem, 2023).

Finally, presented below is the framework that constitutes the theoretical contribution because of the dearth of research in organizational development in waste management (OD-dumpsite, OD-recycling, OD-training, and OD-finance performance). Presented in "Fig. 1" below:

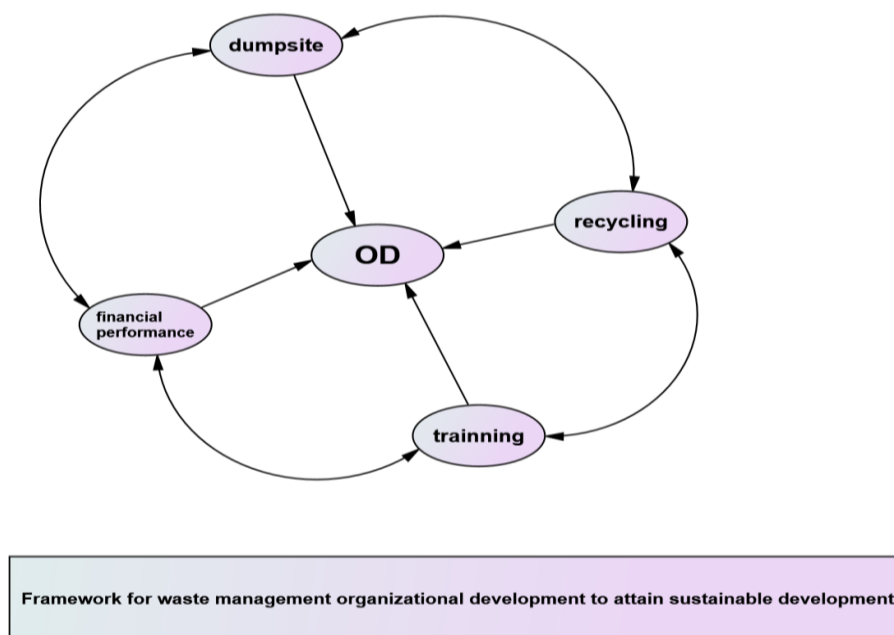


Fig. 1 Framework (Source: Author)

MATERIALS AND METHODS

A questionnaire created to assess the validity and reliability of the organizational development among trash organizations is used in this study. A survey that was conducted in person yielded quantitative results. Stratified random sampling is necessary because the target population and the respondents are homogeneous groups. Mohameda et al., (2023) and Bahkia et al. (2019), recommended using at least 100 samples for the EFA to produce reliable results. A total of 190 were selected from government agencies and private sector participants (PSPs) engaging in the waste management industry in southwest Nigeria. They were examined using (Krejci and Morgan; Olatunde & Ogunode, 2020). Following the pre-testing phase, the researcher modifies the instruments following the recommendations made by all the experts who provided feedback (Bag et al., 2021a; Saikang et al., 2023).

Upon completion, the researcher carries out a pilot study in southwest Nigeria that assesses innovative development tools for the validity and reliability of organizational development in the waste management industry. Consequently, EFA was conducted using IBM-SPSS 26.0 for Analysis.

Study Instruments

This study's instruments pass through three stages: Expert Face Validity, Content Validity, and Criterion Validity: First, the instrument is examined through a language professional, and the items are corrected and changed according to their advice. Face validity is vital because it provides a simple means of assessing the overall validity of a language professional exam or technique. It is a somewhat simple, faster, and obvious method to begin determining whether a new measure initially appears to be beneficial (Bahkia et al., 2019).

Expert Content Validity: The next step is content validity, wherein an expert in statistics evaluates the instrument to determine its level of bias-free coverage and how effectively it encompasses all relevant facets of the construct it is meant to measure (Qiu & Dooley, 2019; Hair et al., 2020). Lastly is Criterion Validity: The instrumented assessment culminates in the criterion phase, which is determined by evaluating the instrument's ability to accurately capture the anticipated outcome of organizational development. This makes use of Concurrent validity to assess them in the here and now, while predictive validity evaluates in the future (Husain et al., 2023)

Pilot study

This study conducted a pilot study. The purpose of the pilot project was to collect data with the recently created questionnaire from the sampling frame, which consists of government waste management agencies and PSP in southwest Nigeria about 190 respondents was stratified and randomly chosen. The previous literature was guided for taking appropriate measures at this stage (Shkeer & Awang, 2019). As said earlier the questionnaire was adapted and modified from the previous studies (Das and Hassan, 2022; Rawashdeh, & Tamimi, 2020; Ishak et al., 2023).

Factor Analysis (EFA) in Exploration

Version 26.0 of IBM SPSS was used to analyze the research data. The principal component analysis method (PCA) used method EFA to examine construct validity and instrument validity. A statistical method called exploratory factor analysis (EFA) can be used to determine a set of variables' underlying structure. EFA helps researchers and practitioners pinpoint the critical elements affecting waste management, organizational development dumpsite, and OD-recycle. OD training and OD- financial performance, employee performance, organizational effectiveness, and other pertinent outcomes in the context of PSPs' organizational development (Husain et al., 2023).

In contrast EFA aids in the identification of latent constructs and dimensions that support organizational success by examining the interactions between various variables. EFA has been used in several research to investigate the factors of employee engagement and organizational development (Mkheimer & Mjlae, 2020; Mohameda et al., 2023). However, EFA and Reliability Analysis have been used by previous researchers in areas of academic titles like Financial Well-being Instrument Among Trainee Teachers (Anuar et al., 2023; Exploratory factor analysis on occupational stress (Bahkia et al., 2023; Dehisat & Awang 2020).

This study carried out an EFA on organizational development among waste management agencies and PSPs in the waste management industry in southwest Nigeria to determine the main variables. The impact of organizational effectiveness and development in a sample of PSPs. Their research identified several elements that have a major impact on the contractor's and agencies' morale, including organizational culture, effective management of landfills, financial performance, and procurement of recycling facilities. In addition, the researcher utilized the Cronbach Alpha, statistical tools to assess the degree of trustworthiness of the constructs

RESULTS

The validity of the construct and reliability of items findings were presented in Table 1 to 5 below:

Exploratory Factor Analysis (EFA) of Organizational Development (OD)

Question no appears in column one of Table 1, the item statement appears in column two as the mean, while column three is the standard deviation. In Table 1; the 14 items in the questionnaire that measure the OD (referred to as Q1 through Q14) construct are shown in Table 1 with descriptive statistics for each item. The mean value falls between 2.47 and 4.49 while the standard deviation of each item ranges from 0.615 to 1.442, see Table 1 at the centre. The EFA process was analyzed using the four essential constructs of the OD found in the literature review. In this case, every OD subcomponent (Dumpsite, recycling, training, and financial performance was looked at concurrently. Therefore, the Cronbach alpha for all constructs is 0.890. The EFA analysis was applied, as a result, the 14 items were divided into four distinct components, and the analysis was completed. All 14 items were kept because all factor loadings were > 0.6 . See below at the Centre Table 1.

Table 1 Descriptive Statistics

Q. No.	Item Statements	Mean	Standard Deviation
Q1	Frequent delays experienced by the compactor driver at the landfill	2.83	1.437
Q2	There are adequate facilities e.g. caterpillar is available at the landfill	2.76	1.326
Q3	There is an alternative if the landfill is incidentally closed	2.54	1.442
Q4	The landfill is accessible by compactor vehicles by schedule	3.87	1.127
Q5	The landfill is operating as expected for dumping waste	2.80	1.338
Q6	I am aware that recycling reduces pollution	4.49	.615
Q7	Recycling gives way to reduce waste at landfill	3.04	1.338
Q8	There are enough experts trained for recycling	2.47	1.375
Q9	There is an adequate facility for converting waste to create jobs or employment	3.77	1.183
Q10	I am aware that recycling helps extend the lifespan of Dumpsites	3.13	1.413
Q11	The organization facilitate employees to attend a workshop or conference	4.21	0.948
Q12	The organization provides internal resources for training and re-training	3.96	1.073
Q13	Waste management organizations believe that training and re-training are important	3.91	1.246
Q14	Waste management organizations believe that training is important	3.14	1.356
Cronbach's alpha 0.890 > 0.6			

Meyer-Olkin Kaiser (KMO)

Furthermore, EFA uses principal components Analysis (PCA) since its extraction method performs for the fourteen (14) items to measure organizational development constructs. The result depicts that the Bartlett's test of Sphericity is highly significant with a (p-value < 0.05). Moreover, it also fulfilled the measuring sampling of adequacy (KMO) reaching 0.758 above the minimum value of 0.6 (Mohameda et al., 2023). This shows that it is capable of further analysis, as presented in Table 2.

Table 2 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.758
	Approx. Chi-Square	2359.532
Bartlett's Test of Sphericity	df	91
	Sig.	.000

Rotated Matrix

There is an additional variable required through the rotation based on the result given differs from previous literature, previous literature makes use of three components (Das and Hassan 2022; Rawashdeh & Tamimi, 2020); Ishak et al., 2023; Tien et al., 2020). This study found four components that emerged through EFA as presented in Table 3. Many researchers have emphasized the importance of EFA in every construct to ascertain whether the items would give distinct dimensions of previous studies, such as Shkeer & Awang (2019) and Awang et al. (2023), when objects are adapted and modified to a new research topic from various domains, their dimensionality may change. This may occur because of the changes in the characteristics of the respondents, economic changes, environmental factors and longtime of carrying out research in that field (Dehisat & Awang, 2020). Presented in Table 3 below. Rotated Matrix shows the factor loading is capable of further analysis, as presented in Table 3

Table 3 Component produced through EFA

Items	A Component 1	A Component 2	A Component 3	A Component 4
Q1	0.852			
Q2	0.887			
Q3	0.898			
Q4	0.881			
Q5	0.815			
Q6		0.867		
Q7		0.894		
Q8		0.819		
Q9		0.779		
Q10			0.781	
Q11			0.876	
Q12			0.910	
Q13				0.907
Q14				0.652

Total Variance Explained and Components

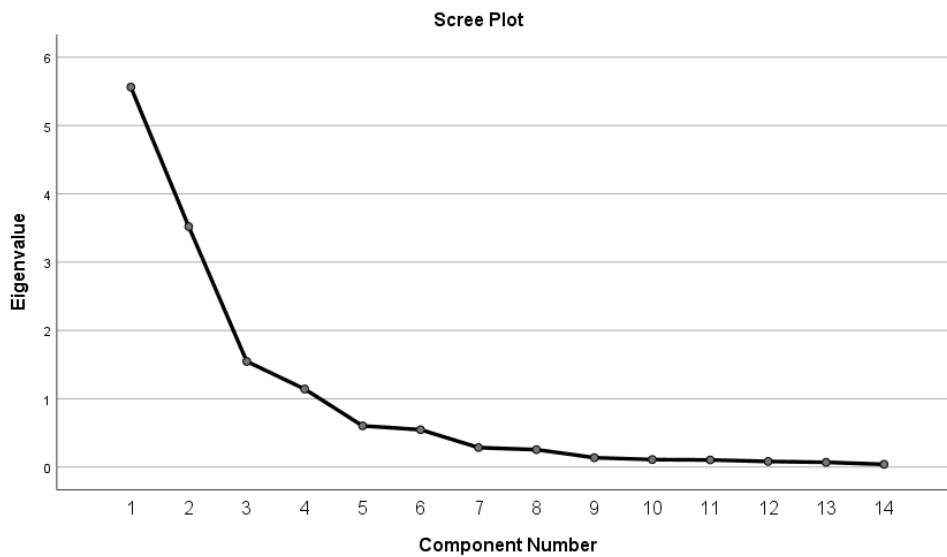
Based on an Eigenvalue of more than one (>1.0), this study described the four components that arose from the EFA method. However, there is a variance of 39.731% in Component 1. Part Number Two possesses 25.142, Component 3 has 11.042% and Component 4 has a variance of 8.160%. Therefore, the variance contribution for all the components is 84.075% (Awang et al., 2023 pp. 95). This shows that each component is good for assessing organizational development (OD). Presented in Table 4 below:

Table 4 Total Variance Explained for OD Constructs (TVE)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Dumpsite	5.562	39.731	39.731	5.562	39.731	39.731	4.080	29.142	29.142
Recycling	3.520	25.142	64.874	3.520	25.142	64.874	3.694	26.387	55.529
Training	1.546	11.042	75.916	1.546	11.042	75.916	2.514	17.960	73.489
Financial p.	1.142	8.160	84.075	1.142	8.160	84.075	1.482	10.586	84.075
14	.039	.281	100.000						

Extraction Method: Principal Component Analysis

In addition to Table 4, the scree plot graph shows that there are 14 objects divided into four parts by the plot of the screen for the OD design (Figure 2). The EFA approach produced four components for this design, as shown by the screen plot as seen in Figure 2 below; the EFA process then separated the 14 items into four categories. According to Dehisat & Awang (2020) and Husain et al. (2023), each component has a set number of items that are grouped under their corresponding components in the rotational component matrix. In conclusion, the Eigenvalue and cumulative value. See below the Scree plot.

**Fig. 2** Scree plot of organizational development

Reliability of the Instruments

In organizational research, reliability analysis using Cronbach Alpha evaluates the stability and consistency of measurement tools like surveys and questionnaires. Ensuring the validity and reliability of waste management agencies and PSP data is crucial for drawing appropriate conclusions and making well-informed decisions on organizational development activities. The reliability analysis is essential in waste management agencies and PSPs because it validates the measurement instruments used to evaluate different organizational constructs. To evaluate the internal consistency of a survey instrument measuring organizational development among waste management agencies and PSPs, carried out a reliability analysis (Sule et al., 2022; Babagana et al., 2019). High-reliability coefficients for the instrument were shown in their study, suggesting that it is appropriate for evaluating organizational atmosphere in comparable circumstances. Integration of EFA and Reliability Analysis integration would provide a thorough method for comprehending organizational development in PSPs (Husain et al., 2023). While reliability analysis assures the consistency and quality of measuring tools used in data gathering, exploratory factor analysis (EFA) aids in uncovering the underlying factors impacting organizational outcomes. Furthermore, researchers can improve the validity of their findings and adjust their measurement models through the iterative process of Reliability Analysis and EFA. Academics can create reliable instruments for evaluating different facets of organizational development among government waste management agencies and PSPs by repeatedly testing and improving assessment instruments (Mkheimer & Mjlae, 2020; Somwethee et al., 2023). The reliability statistic table and Cronbach Alpha are presented below in Table 5:

Table 5 Constructs Cronbach's Alpha

No	Constructs	Item number	Construct Cronbach's Alpha
1	Dumpsite	5	0.736
2	Recycling	4	0.882
3	Training	3	0.718
4	Financial performance	2	0.852
	Item all	14	0.890

DISCUSSION

The purpose of this study is to use the EFA to assess the validity and reliability of OD items among Waste management agencies and PSPs. However, an interval scale such as a 5-point interval scale offers greater flexibility and precision to the measuring model as it saves time for respondents to fill, it is preferred over a 10-point interval scale. With the use of EFA, the sample size for this study was 190 among waste management agencies and PSPs are adequate. There are different opinions on sample size while some authors suggest between 50 and 250 (Misra et al., 2021). Moreover, 190 was recommended by Dabbagh et al. (2023), and the four constructs OD-Dumpsite, OD-recycling, OD-training, and OD-financial performance were gauged the OD using the EFA results.

The construct contributes above 80% of the variance in the items' relationship can be explained (in Table 4). Because all 14 of the questionnaire's items had factor loadings greater than 0.60 for the OD construct all 14 items were kept. Four components for the OD construct have been established by the study's conclusions. According to studies by Awang et al. (2023), and Munisamy et al. (2022), the four constructs similarly exhibit good reliability, with Cronbach Alpha (α) for all constructs at 0.890, while Cronbach Alpha for each construct such as OD- Dumpsite is 0.736; OD-Recycling 0.882; OD-Training 0.718 and OD-financial performance 0.852 (in Table 5). To ascertain the current correlations between the latent variables, more variables that influence organizational development using confirmatory factor analysis (CFA) techniques are still required.

Through our previous literature review, we discovered that variables like OD-dumpsite, OD-recycling, OD-training, and OD-financial performance constitute the framework of this study, created because of the gap in the previous studies. Much previous literature discussed variables like dumpsites extensively based on the treatment and result of pollution, LFG capture and leachate production from the dumpsite process but none of them related to waste management organizational development who are the drivers. This study investigates the challenges faced by Southwest Waste Management We discovered Agencies and PSPs who are the waste evacuators, their experience at landfills, and how these can be solved through the integration of parametric tools known as EFA to achieve organizational development.

Moreover, none of the previous literature investigated their studies on empirical study, most are reviews. OD-recycling was established through the establishment of a recycling centre to divert waste from landfills to reduce congesting dumpsites, and the problem posed to the ecosystem. The only waste taken to dumpsites would be scrapped that produced after recycling. This would reduce carbon emissions produced by compactor vehicles, and save costs and time for both waste management agencies and PSPs. OD- training, required modern training for employees who are contractors due to global trends would enhance competition to achieve organizational development.

Furthermore, this study contributes to empirical study. Previous studies failed to make use of financial performance; this is also required by the drivers to achieve organizational development. Through EFA the components were generated which serve as new additional measures to overcome challenges facing waste management organizations in southwest Nigeria because of the empirical study investigated. Finally, this study introduced the importance of theory in achieving organizational development while previous studies failed to integrate theory into waste management. The theory of corporate culture or market theory, as described previously in the literature integration would assist the waste management agencies and PSPs in attaining organizational goals.

CONCLUSION

To sum up, the utilization of Exploratory Factor Analysis (EFA) and Reliability Analysis was found to be quite advantageous when attempting to comprehend and evaluate the organizational development of waste management agencies and private sector participants (PSPs) in south-west Nigeria. While reliability analysis maintains the consistency and accuracy of measuring organizational development of waste management. Exploratory factor analysis (EFA) aids in discovering critical factors influencing organizational development that differ from previous studies. Combining these methods provides a solid method for investigating the intricate waste management agencies and PSP's organization dynamics and creating successful organizational development plans.

There is a need for policymakers, professionals, and academics to support the integration of parametric techniques like EFA analysis and theories like corporate culture theory to address issues and improve knowledge in waste management organisations, especially when it comes to adjusting to sustainable trends. The result of reliability analysis and EFA should be used in future studies to further our comprehension of organizational development in the waste business management and private sector industry.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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