

Review Article

# Geospatial-based Landfill Site Selection in Developing Countries: An In-depth Review of Theories, Methodologies, and Criteria

Adimasu Tafesse Gontte\* 

Department of Geography and Environmental Studies, Wollega University, Gimbi, Ethiopia

## Abstract

Effective landfill site selection is crucial for sustainable waste management, particularly in regions facing rapid urbanization and limited resources. The increasing pressure on waste management systems necessitates a systematic approach to landfill siting. Many landfill siting studies struggle to address the unique challenges of developing countries, where resource constraints and environmental impacts are significant concerns. Existing research often lacks comprehensive methodologies that integrate various technological advances. This study aims to analyze geospatial-based landfill site selection methodologies in developing countries, focusing on research published from 2014 to 2024. It synthesizes various theoretical approaches, emphasizing the integration of geographic information systems (GIS), multi-criteria decision analysis (MCDA), and remote sensing technologies. The review identifies key site selection criteria, such as environmental impact, economic feasibility, and community acceptance, to mitigate negative effects on public health and the environment. The analytical hierarchy process is the primary method used for assigning weights to the selection criteria. Additionally, the review discusses policy frameworks and regulatory considerations that shape effective landfill site selection. It highlights gaps in existing research, including the need for localized studies and the integration of emerging technologies. By addressing these gaps, the review provides valuable insights for researchers and policymakers. Ultimately, it seeks to enhance the understanding of sustainable waste management practices in developing countries, promoting more effective landfill site selection strategies that consider diverse aspects.

## Keywords

Analytical Hierarchy Process, Geographic Information System, Stakeholders, Systematic Approach, Geospatial Technologies

## 1. Introduction

Waste is a material discharged and discarded from each stage of daily human life activities [33], which leads to adverse impacts on human health and the environment [21]. The management of municipal solid waste (MSW) is an increasingly critical issue in developing countries [46, 45], where rapid urbanization, population growth, and inadequate waste

management infrastructure converge to create significant environmental and public health challenges. As urban centers expand, the amount of waste generated escalates [25], straining existing waste management systems and often leading to severe ecological degradation, groundwater contamination, and public health risks [21]. Due to the rapid

\*Corresponding author: [adimasutafesse74@gmail.com](mailto:adimasutafesse74@gmail.com) (Adimasu Tafesse Gontte)

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increase in production and consumption processes [31], societies generate as well as reject solid materials regularly from agricultural, commercial, domestic, industrial, and institutional sectors [42, 2]. Many developing nations continue to rely on, landfilling as their primary waste disposal method due to limited financial and technological capabilities [17]. In this context, effective landfill site selection becomes paramount to mitigate adverse effects on the environment and local communities [25], ensuring that waste management practices align with principles of sustainability and social equity [3].

Despite the recognized importance of landfill site selection, numerous challenges hinder the effective implementation of strategic waste management practices in developing countries [22, 26]. The most common problems associated with poor management of solid waste include; transmission diseases, fire hazards, foul odor, atmospheric and water pollution, aesthetics, pain, and economic victims [42, 29]. Traditional methods of site selection frequently overlook critical factors such as environmental impact assessments, socio-economic conditions, and community involvement [35]. Landfill site selection for the disposal of wastes is a tricky and difficult process [26, 25], that demands an analytical assessment of several criteria such as environmental, financial, social, and technical parameters [2, 6]. Furthermore, the lack of integration of modern geospatial technologies, such as Geographic Information Systems (GIS) and remote sensing, limits decision-makers' ability to make informed choices [9]. This gap in methodology can result in sites that pose risks to both the environment and local communities [12]. The absence of comprehensive frameworks that address local conditions, stakeholder concerns, and regulatory requirements can result in landfill sites that pose significant risks to both the environment and public health [49]. To overcome this problem proper landfill site selection is an essential step in solid waste disposal practice (Ibrahim et al., 2018) and towards ensuring a sustainable environment, good health, and quality of life for the future [33]. Thus, the need for a more systematic approach to landfill site selection that leverages technological advancements and local knowledge is evident [31].

The general objective of this review is to consolidate and critically analyze geospatial-based methodologies for landfill site selection in developing countries, focusing specifically on research published from 2014 to 2024. The findings may also serve as a foundation for future research, guiding scholars to explore under-researched areas related to waste management in developing contexts. Despite advancements in the field, there remains a critical gap in localized studies that address the unique challenges faced by specific regions within developing countries [39]. Existing research often generalizes findings without considering local socio-economic conditions and environmental contexts [49]. Generally, this review seeks to fill those gaps by synthesizing recent studies and emphasizing the need for tailored methodologies that leverage local knowledge, involve community stakeholders, and utilize modern geospatial technologies to enhance decision-making

processes in the field.

## 2. Literature Review

### 2.1. Theoretical Frameworks

#### 2.1.1. Stakeholder Approach

It emphasizes the collaboration and communication among all parties involved to ensure that diverse perspectives in waste management decision-making processes [23]. Engaging stakeholders not only enhances the effectiveness and legitimacy of waste management initiatives but also fosters trust and accountability within the community [41]. Recent studies highlight that inclusive stakeholder engagement can lead to more innovative solutions and improved compliance with waste management policies, as it allows for the incorporation of local knowledge and values [34]. Furthermore, aligning stakeholder interests can help mitigate conflicts and enhance the sustainability of waste management practices [9].

#### 2.1.2. Institutional Approach

This theory underscores the importance of institutional (formal and informal) frameworks in influencing the behavior of organizations and individuals, suggesting that effective waste management policies must align with existing institutional structures [36]. Recent research indicates that institutional pressures, including regulatory requirements and community expectations, significantly impact the adoption of sustainable waste management practices [10]. Furthermore, understanding these institutional influences is crucial for developing successful waste management strategies, as they can determine the feasibility and acceptance of innovative approaches [32]. By aligning waste management initiatives with institutional norms and values, stakeholders can enhance compliance and foster long-term sustainability [13].

#### 2.1.3. Sustainable Development Approach

This approach emphasizes that implementing sustainable practices can yield long-term benefits for both society and the environment, encouraging policies that minimize negative impacts while enhancing quality of life [22]. Recent studies highlight the importance of integrating sustainability principles into waste management strategies, demonstrating that such integration can lead to improved resource efficiency and reduced environmental degradation [49]. Moreover, fostering community participation in waste management initiatives is essential for achieving social equity, as it ensures that diverse voices are heard and considered in decision-making processes. Ultimately, aligning waste management practices with sustainable development goals is crucial for creating resilient and adaptive communities [7].

### 2.1.4. Zero Waste Approach

According to US Environmental Protection Agency, “zero waste” is defined as “the conservation of all resources [47], through responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning to land, water, or air that endanger the environment or human health” as cited in [16]. The primary goal of “zero waste” (all discarded materials are designed to become resources for others to use) focuses more on how to guide people in changing their lifestyles and practices to emulate sustainable natural cycles [46].

### 2.1.5. Systems Approach

This perspective promotes a holistic understanding of waste management practices, emphasizing the importance of integrated approaches that consider environmental, social, and economic factors [49]. By employing systems thinking, stakeholders can better identify inefficiencies and opportunities for improvement within the waste management cycle [17]. Recent studies have highlighted how systems theory can facilitate the development of circular economy models, which aim to minimize waste and enhance resource efficiency across the entire lifecycle of materials [38, 47]. Furthermore, adopting a systems approach enables more effective stakeholder collaboration [41] and the alignment of diverse interests, ultimately leading to more sustainable waste management solutions [28, 27].

Generally, different researchers in developing countries have used systematic or integration approach of municipal solid waste management and the main reason behind the choice of this approach from the rest approaches: (I) it is based on the principle that there is no single solution in waste management system dealing with the reuse and recycling of waste products than just disposing to the ground. (II) It is made up of several interconnected processes. (III) An umbrella for overall approach because of it considers social, economic and environmental aspects. (IV) It is also inclusive of all necessary procedures and phases in the waste management system. (V) Finally, it considers resource reuse and recycling before final disposal. But, MSWM in Ethiopia has mainly targeted waste collection from the source and its transportation to disposal sites. This is mainly due to inadequate institutional capacity, finances, knowledge, awareness, and a lack of effective planning and implementation [46].

## 2.2. Geospatial Technologies

Geographic Information Systems (GIS) and remote sensing are powerful tools increasingly utilized in site selection processes across various fields, including urban planning, environmental management, and waste management [31, 21]. GIS enables the integration, analysis, and visualization of spatial data, allowing decision-makers to assess multiple criteria effectively [49]. Remote sensing complements GIS by providing real-time data and imagery from satellites or aerial

platforms, which can be invaluable for monitoring land use, vegetation cover, and environmental changes [19].

One of the primary applications of GIS and remote sensing in site selection is in the identification of suitable locations for facilities [18, 49], such as landfills, recycling centers, and industrial sites. For example, a study by [5], demonstrated how GIS-based multi-criteria decision analysis (MCDA) can effectively evaluate potential landfill sites by considering factors such as proximity to residential areas, environmental sensitivity, and accessibility. Similarly, remote sensing data can enhance the accuracy of these assessments by providing up-to-date information on land cover [1], and usage patterns, which is crucial for understanding the environmental impact of proposed sites [32].

Moreover, GIS and remote sensing play a significant role in urban planning, particularly in assessing land suitability for development [47]. Research by [18], highlighted the use of remote sensing in urban heat island mapping, which is essential for selecting sites that mitigate heat effects in urban environments. This approach ensures that new developments are strategically located to promote sustainability and resilience against climate change [25]. In the context of environmental management, GIS and remote sensing contribute to biodiversity conservation and natural resource management [39]. For example, a study by [49], utilized remote sensing data to identify critical habitats for endangered species, guiding conservation efforts and site selection for protected areas. This demonstrates the ability of these technologies to inform decisions that balance ecological integrity with human development needs [17]. In summary, the integration of GIS and remote sensing offers significant advantages in site selection processes by providing comprehensive spatial analyses and real-time data [20]. Their applications span various sectors, enhancing decision-making and promoting sustainable development practices [22].

## 2.3. Criteria for Site Selection

Site selection is a critical process in various fields, including urban planning, waste management, and facility siting [8]. Effective site selection requires a comprehensive evaluation of environmental, social, and economic criteria to ensure that chosen locations meet sustainability and community needs [21]. Recent studies have highlighted the importance of these criteria in guiding decision-making processes.

### 2.3.1. Environmental Criteria

Environmental criteria often serve as a primary consideration in site selection [8, 47]. Key factors include land use patterns, proximity to sensitive ecosystems, and potential impacts on air and water quality. For instance, [49] identified critical environmental indicators such as soil quality, biodiversity, and hydrology when evaluating potential landfill sites. Additionally, remote sensing technologies have enabled more precise assessments of land cover changes and environmental

sensitivity, facilitating informed decision-making [19, 18]. The inclusion of climate resilience measures, such as flood risk assessments, has also gained prominence in recent site selection frameworks [20].

### 2.3.2. Social Criteria

Social criteria are essential for ensuring that site selection processes consider community needs and values [33]. Factors such as proximity to residential areas, public health impacts, and community acceptance play crucial roles in evaluating potential sites. Research by [5] emphasized the importance of social equity, highlighting how sites should minimize negative impacts on vulnerable populations. Community engagement and participatory approaches have been shown to enhance the legitimacy and acceptance of site selection decisions [41]. Furthermore, social criteria can encompass cultural heritage considerations, ensuring that development does not disrupt historically significant areas [32, 26].

### 2.3.3. Economic Criteria

Economic criteria focus on the financial viability and long-term sustainability of site selection decisions [47]. Key factors include land acquisition costs, infrastructure availability, and potential economic benefits to the community [47]. Studies have indicated that economic analyses should consider both direct and indirect costs, including maintenance and operational expenses. The concept of cost-benefit analysis is often employed to evaluate the trade-offs associated with different site options, ensuring that decisions align with broader economic goals [8, 7]. Furthermore, incorporating the economic impacts of environmental degradation can help create a more comprehensive understanding of the true costs of site selection [22]. In summary, effective site selection requires a balanced consideration of environmental, social, and economic criteria [7, 47]. Recent studies highlight the importance of integrating these factors into decision-making processes to promote sustainable and equitable outcomes. By employing a multi-criteria decision analysis approach, stakeholders can better navigate the complexities of site selection and ensure that chosen sites align with community values and sustainability goals [8, 37].

## 2.4. Spatial Multi-Criteria Decision Analysis Methods

Selecting a municipal solid waste dump site is a Spatial Multi-criteria Decision Analysis (SMCDA) for which both GIS and Multi-criteria Decision Analysis methods should be used [21, 33]. SMCDA is a process that combines and transforms geographical data (the input) into a decision or the output [18, 47]. This process consists of procedures that involve the utilization of geographical data, the decision maker's preferences, and the manipulation of the data and preferences according to specified decision rules [18]. The capa-

bility of GIS is reliant on spatial analysis functions such as overlay, connectivity, and proximity [16]. These functions, however, always do not provide the best decision alternatives when there are complex and conflicting sets of criteria present [16]. Further, MCDA consists of a series of techniques that permit a range of criteria relating to a particular issue to be scored, weighted and then ranked [8] by, for example, experts, interest groups and/or stakeholders according to their degree of suitability or importance for locating a particular facility [33]. The integration of GIS and MCE is an effective tool to resolve the landfill site selection problem as GIS delivers efficient management and presentation of the data and MCE supplies reliable ranking of the landfill areas based on a range of criteria [31]. One of the most important rules governing the use of GIS for spatial decision support systems is that GIS themselves do not make decisions - people do [12, 24]. Thus, employing GIS and multi-criteria decision analysis is crucial for site selection [29]. The top five and most commonly used MCDA methods in Solid Waste Management are Analytic Hierarchy Process (AHP), Simple Additive Weighting (SAW), Elimination and Choice Translating Reality (ELECTRE), Preference Ranking Organization Method for Enrichment Evaluation (PROMETHEE) and TOPSIS called Technique for Order of Preference by Similarity to Ideal Solution [39].

## 2.5. Analytic Hierarchical Process

The Analytic Hierarchy Process was conceived by Thomas Saaty in 1980 is a structured technique that can be used when dealing with complex decisions involving multiple and conflicting criteria that may be both qualitative and quantitative in nature [48]. It's the most important method for the decision-making process by assigning a weight to, the individual criterion [39]. Assigning of individual criteria was ranked using expert's opinion relative to its importance with selected criteria values from the saaty's 1 to 9 scale [18]. From top five MCDA methods AHP is one of the most commonly used because of the following main advantages: Applicable when exact and total information is collected, a decision problem can be fragmented into its smallest elements, making evidence of each criterion applied, applicable for either single or multiple problems since it incorporates qualitative and quantitative criteria, and generation of inconsistency index to assure decision-makers [4, 33].

## 2.6. Case Studies

The case studies (Table 1) illustrate various critical aspects of geospatial-based landfill site selection in developing countries. They emphasize the need for reliable data, community involvement, and innovative methodologies, while also underscoring the unique challenges faced in these contexts. Addressing these considerations is vital for the successful implementation of landfill projects that meet both environmental and social needs. Finally, the case studies on



geospatial-based landfill site selection in developing countries by different researchers highlight several critical aspects essential for effective waste management.

**Table 1.** Landfill selection by different researchers.

| Author (year) | Study area            | Title   | Methodology   | Strength   | Limitations   |
|---------------|-----------------------|---|---|--|---|
| 44            | S ão Paulo, Brazil    | GIS for Landfill Site Selection                   | Utilized GIS to assess potential landfill sites by analyzing different criteria.                | Identification of optimal sites.                                   | Resistance from local communities to site proposals.                              |
| 23            | Nairobi, Kenya        | Remote Sensing for Landfill Site Assessment       | Employed remote sensing data to evaluate land suitability.                                      | Effective identification of suitable sites.                        | Technical capacity for data interpretation remains limited.                       |
| 1             | Lagos, Nigeria        | GIS-Driven Landfill Location                      | Planning Developed a GIS framework to analyze and select landfill sites.                        | Improved decision-making processes for site selection.             | High population density complicates site selection.                               |
| 14            | CapeTown, SouthAfrica | Landfill Site Selection Using GIS                 | Used GIS to evaluate multiple factors for landfill siting.                                      | Enhanced public engagement in the site selection process.          | Data gaps hindered ample analysis.  |
| 15            | Cairo, Egypt          | Spatial Analysis for Landfill Siting              | Conducted a spatial analysis using GIS to identify potential landfill sites.                    | Enhanced sympathetic of spatial dynamics affecting site selection. | Official resistance to adopting GIS in planning processes.                        |
| 30            | Dhaka, Bangladesh     | GIS-Based Landfill Site Identification            | Analyzed spatial data to identify suitable landfill sites.                                      | Increased participation of communities in the planning process.    | Limited technical expertise in GIS among local planners.                          |
| 40            | Manila, Philippines   | GIS for Sustainable Landfill Site Selection       | Utilized GIS to assess spatial data for selecting landfill potential landfill sites.            | Improved selection criteria based on comprehensive data analysis   | Corruption and mismanagement hindered effective implementation of recommendations |
| 35            | Hanoi, Vietnam        | Geospatial Analysis for Landfill Site Selection   | Employed geospatial tools to evaluate potential landfill sites.                                 | Successful identification of sites that meet standards.            | Ongoing land tenure disputes affect site selection.                               |
| 43            | Medell ín, Colombia   | GIS-Based Landfill Selection                      | Methodology Settled a GIS framework for evaluating landfill.                                    | Improved efficiency in site selection processes.                   | Geographic barriers in certain areas complicated site assessments.                |
| 11            | Bangkok, Thailand     | Geospatial Modeling for Landfill Location         | Utilized geospatial modeling techniques to identify optimal landfill sites                      | Enhanced accuracy in site selection.                               | Limited enforcement of environmental regulations.                                 |
| 15            | Casablanca, Morocco   | GIS for Landfill Site Selection Planning.         | Developed a GIS-based approach to evaluate potential landfill sites based on selected criteria. | Improved and facilitated stakeholder engagement processes.         | Insufficient data availability and; ongoing urban expansion complicates           |
| 47            | Addis Ababa, Ethiopia | Geospatial Approaches for Landfill Site Selection | Employed GIS to analyze waste generation data and environmental factors.                        | Increased focus on data-driven approaches.                         | Challenges in data collection and analysis.                                       |

This empirical review synthesizes recent research on landfill site selection, employed in scientific papers that were published in different developing countries across different geographical contexts. The studies predominantly utilize GIS

and MCDA to evaluate potential landfill sites based on various environmental, social, and economic criteria. Key strengths of these approaches include their ability to enhance transparency in decision-making, improve stakeholder en-

gement, and identify optimal locations for waste management facilities. However, several limitations have been identified across the studies. Common challenges include resistance from local communities, inadequate stakeholder involvement, and technical capacity issues related to data interpretation and GIS expertise. Additionally, inconsistent data on land use and ongoing urban expansion complicate effective site assessments. Overall, while the integration of advanced geospatial tools has significantly improved the efficiency and accuracy of landfill site selection, addressing the highlighted limitations is crucial for ensuring sustainable and community-accepted waste management solutions in the future.

### 3. Materials and methods

#### 3.1. Description of the Systematic Review Process

##### 3.1.1. Review Approach

This systematic review aims to synthesize existing literature on geospatial-based landfill site selection methodologies in developing countries, emphasizing theoretical frameworks, applied methodologies, and selection criteria. The review process was structured to ensure a comprehensive evaluation of relevant studies [34], following established systematic review protocols.

##### 3.1.2. Literature Search Strategy

A systematic literature search was conducted across multiple databases, including Scopus, Web of Science, and Google Scholar, to identify peer-reviewed articles published between 2014 and 2024. The search used a combination of keywords such as "geospatial," "landfill site selection," "developing countries," "remote sensing," and "criteria." Boolean operators were employed to refine the search results and ensure the inclusion of studies directly relevant to the research question.

##### 3.1.3. Inclusion and Exclusion Criteria

The inclusion criteria for the selected studies were as follows: (1) articles published between 2014 and 2024, (2) studies that specifically address landfill site selection in developing countries, (3) research employing geospatial techniques, including Geographic Information Systems (GIS), remote sensing, and multi-criteria decision analysis, and (4) only peer-reviewed articles were included to ensure credibility. Conversely, the exclusion criteria comprised: (1) non-English publications, (2) studies unrelated to landfill site selection or those focusing on developed countries, and (3) theoretical papers that did not present empirical data or case studies relevant to geospatial methodologies. The application of these criteria (Table 2) yielded a refined selection of literature aligned with the study's objectives, consistent with systematic review principles [30].

**Table 2.** Inclusion and exclusion criteria.

| Criteria         | Inclusion  | Exclusion   |
|------------------|--|---|
| Publication Date | Articles published between 2014 and 2024   | Non-English publications  |
| Focus Area       | Studies specifically addressing landfill site selection in developing countries                        | Studies unrelated to landfill site selection or focusing on developed countries |
| Research Methods | Research employing geospatial techniques (e.g., GIS, remote sensing, multi-criteria decision analysis) | Theoretical papers without empirical data or relevant case studies              |
| Publication Type | Only peer-reviewed articles to ensure credibility  | Non-peer-reviewed articles  |

##### 3.1.4. Data Extraction and Synthesis

Data extraction from the selected articles was performed systematically, focusing on the methodologies employed, theoretical frameworks applied, and criteria used for site selection. A narrative synthesis was conducted to identify patterns, gaps, and emerging trends in the literature, offering a comprehensive overview of the current state of knowledge in this field [37].

#### 3.2. Data Sources

In this systematic review, secondary data sources included peer-reviewed academic journals, which provided foundational insights into geospatial methodologies and criteria for landfill site selection. Government reports from environmental agencies were essential for understanding regulatory frameworks impacting practices in developing countries. Documented case studies illustrated the practical applications of geospatial techniques, showcasing how

theoretical frameworks are implemented in specific socio-economic contexts. Additionally, conference proceedings offered perspectives on recent advancements and emerging trends, while theses and dissertations contributed in-depth analyses and original research. Scholarly books and edited volumes enriched the review with foundational theories and broader context. Together, these diverse sources ensured a comprehensive examination of the methodologies and criteria used in geospatial-based landfill site selection.

### 3.3. Analysis Techniques

In these systematic review, several analysis techniques were employed to synthesize findings. Thematic analysis identified and analyzed patterns within the literature, extracting key themes related to theories, methodologies, and criteria for geospatial landfill site selection. This facilitated a nuanced understanding of how various studies address common challenges. Comparative analysis was also conducted to evaluate the effectiveness of different geospatial methodologies across case studies, identifying best practices and gaps in the literature. Additionally, a narrative synthesis integrated findings from multiple studies, providing a cohesive overview of the current state of knowledge and highlighting trends and emerging issues. Together, these technique desktop review methods was applied to analyses the published reports and similar topics that are available in websites, internet, government and non-government organization. After the collection of data from different sources the depth interpretation was applied to identify gaps in tabular and textual formats from different sources to provide possible recommendation for further researchers. The former was mainly used to share and present additional or new ideas in paragraphs and words (to describe the relationship between information), rather than tabular or graph formats. Whereas, the latter was used to share and compare large amounts of information in rows and columns according to the characteristics of data.

## 4. Conclusion

The systematic review identified several effective theories and methodologies that enhance landfill site selection processes in developing countries. Multi-Criteria Decision Analysis (MCDA) emerged as a key methodology, integrating both quantitative and qualitative criteria to evaluate potential sites based on environmental, social, and economic factors. Techniques like the Analytic Hierarchy Process (AHP), were particularly highlighted for their robustness. Geographic Information Systems (GIS) were consistently recognized for their capability to analyze spatial data and visualize potential sites, especially when combined with remote sensing data. Furthermore, integrated approaches that combine GIS, MCDA, and sustainability assessments

provide comprehensive evaluations, ensuring that multiple factors are considered in decision-making. The systematic review indicates several promising areas for future research that can enhance the effectiveness of landfill site selection processes. Firstly, there is a critical need for further investigation into technology integration, particularly the combination of GIS with emerging technologies such as machine learning and artificial intelligence. Secondly, stakeholder engagement requires deeper exploration. Future studies should examine effective strategies for involving local communities and stakeholders and assessment of regulatory frameworks and policies governing landfill site selection process in developing countries. Comparative studies that evaluate the effectiveness of different policy approaches can inform best practices and highlight areas for reform. By focusing on these areas, future researchers can significantly contribute to improving geospatial-based landfill site selection methodologies and practices in developing countries, ultimately leading to more sustainable waste management solutions.

## Abbreviations

|           |   |
|-----------|---|
| AHP       | Analytic Hierarchy Process  |
| ELECTRE   | Elimination and Choice Translating Reality                        |
| GIS       | Geographic Information System                                     |
| MCDA      | Multi-Criteria Decision Analysis                                  |
| MSW       | Municipal Solid Waste   |
| SMCDA     | Spatial Multi-criteria Decision Analysis                          |
| MCE       | Multi-Criteria Evaluation   |
| SAW       | Simple Additive Weighting   |
| PROMETHEE | Preference Ranking Organization Method for Enrichment Evaluation  |
| TOPSIS    | Technique for Order of Preference by Similarity to Ideal Solution |

## Authors Contributions

Adimasu Tafesse Gontte is the sole author. The author read and approved the final manuscript.

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## Data Availability Statement

The author did not generate or collect any primary data for this study. All the information and analyses presented are based on a thorough review of the existing literature related to the title of the study.

## Conflicts of Interest

The authors declared no conflicts of interest.

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