

COMMON CRITERIA AND METHODOLOGIES FOR SELECTING LANDFILL SITES

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Abstract

This article explores the common criteria and methodologies used in the selection of waste landfill sites in the Surkhandarya region. Proper waste disposal is crucial for environmental protection and public health. The study reviews existing literature, presents a methodology for site selection, and discusses the results, emphasizing the importance of sustainable landfill site selection.

Keywords: Waste landfill, Surkhandarya region, site selection, criteria, methodology, environmental protection, public health, sustainability.

Аннотация

В данной статье исследованы общие критерии и методики, используемые при выборе полигонов для мусора в Сурхандарьинской области. Правильная утилизация отходов имеет решающее значение для защиты окружающей среды и здоровья населения. В исследовании рассматривается существующая литература, представлена методология выбора площадки и обсуждаются результаты, подчеркивая важность выбора устойчивой площадки для свалки.

Ключевые слова: Полигон мусора, Сурхандарьинская область, выбор площадки, критерии, методология, охрана окружающей среды, здоровье населения, устойчивость.

INTRODUCTION

The Surkhandarya region, located in southern Uzbekistan, is known for its rich natural beauty and cultural heritage. However, like many other regions, it faces the challenge of waste management. Selecting appropriate landfill sites is a critical aspect of waste management to prevent environmental degradation and protect public health. This article delves into the common criteria and methodologies used for landfill site selection in Surkhandarya.

LITERATURE ANALYSIS AND METHODOLOGY

Effective landfill site selection involves a comprehensive review of existing literature and best practices from around the world. Common criteria and methodologies for waste landfill site selection include:

- Geographic Information Systems (GIS): GIS technology is widely used to analyze geographical data, such as topography, hydrology, and proximity to urban areas, making it essential for site suitability assessments.
- Environmental Impact Assessment (EIA): EIA evaluates potential environmental impacts, including groundwater contamination, soil degradation, and air pollution, to ensure that chosen sites do not harm the environment.



- **Public Health Assessment:** The health of the local population is paramount. Landfill sites should be located at a safe distance from residential areas to minimize the risk of exposure to hazardous waste materials.
- **Social Acceptance:** Public opinion and community engagement are essential. The selection process should consider the social acceptance of the chosen site by involving local stakeholders.
- **Regulatory Compliance:** Compliance with national and international regulations is crucial. Sites must adhere to waste disposal laws and environmental standards.

To select suitable landfill sites in Surkhandarya, a multi-criteria decision analysis (MCDA) approach is recommended. MCDA allows for the integration of various criteria and weights them based on their relative importance. The following steps outline the methodology:

- ✓ **Data Collection:** Gather geographic, environmental, and social data for the region. This includes information on topography, hydrology, land use, population density, and existing waste management infrastructure.
- ✓ **Criteria Selection:** Identify the criteria that are most relevant to landfill site selection, considering environmental, social, and regulatory factors.
- ✓ **Weighting:** Assign weights to each criterion to reflect its importance. Stakeholder input can help determine these weights.
- ✓ **Scoring:** Evaluate potential landfill sites based on the selected criteria and their weights. Use GIS and EIA tools to perform spatial analysis and assess environmental impact.
- ✓ **Ranking:** Rank the potential sites based on their scores. The highest-ranked sites are the most suitable for landfill development.

RESULTS

The application of the MCDA approach in Surkhandarya can lead to the identification of landfill sites that minimize environmental impact, protect public health, and gain social acceptance. By utilizing GIS and EIA tools, the region can establish sustainable waste disposal practices that align with national and international standards.

Selecting landfill sites is a complex process that requires careful consideration of various criteria and the application of specific methodologies. The aim is to identify locations that minimize environmental impact, protect public health, and adhere to regulatory standards. Here are the common criteria and methodologies used for selecting landfill sites:

Common Criteria for Selecting Landfill Sites:

1. **Proximity to Waste Sources:** Landfills should be reasonably close to areas generating waste to minimize transportation costs and carbon emissions. However, they should not be too close to densely populated or environmentally sensitive areas.
2. **Geological and Hydrogeological Factors:** The geology and hydrogeology of the site play a crucial role. Sites with impermeable clay or rock layers can help prevent the leaching of contaminants into groundwater.
3. **Topography:** Land should have a suitable topography to ensure proper drainage, reducing the risk of flooding and preventing the accumulation of leachate.
4. **Distance from Water Bodies:** Landfills should be located at a safe distance from rivers, lakes, and groundwater sources to prevent contamination.
5. **Soil Type:** The type of soil at the site affects its suitability. Sandy soils may allow for faster leachate infiltration, while clay soils can help contain contaminants.
6. **Adequate Buffer Zones:** Buffer zones should be established to separate landfill sites from residential areas, schools, and healthcare facilities to protect public health.



7. Land Use and Zoning: Consider local land-use plans and zoning regulations to ensure that landfills are in compliance with municipal and regional development goals.
8. Accessibility and Transportation Infrastructure: The site should have good access to roads for waste transportation, minimizing disruption to local communities.
9. Environmental Impact: An Environmental Impact Assessment (EIA) should be conducted to evaluate potential environmental effects, including air quality, odors, noise, and wildlife habitat disruption.
10. Social Acceptance: Public opinion and community engagement are essential. Sites should be chosen with input from local communities to gain social acceptance.
11. Regulatory Compliance: Landfill sites must comply with local, national, and international regulations related to waste management, environmental protection, and health and safety.

CONCLUSION

The application of the MCDA approach in Surkhandarya can lead to the identification of landfill sites that minimize environmental impact, protect public health, and gain social acceptance. By utilizing GIS and EIA tools, the region can establish sustainable waste disposal practices that align with national and international standards.

Methodologies for Selecting Landfill Sites:

1. Geographic Information Systems (GIS): GIS technology is used to analyze spatial data, such as topography, land use, and environmental features, to identify suitable sites and assess their suitability based on predefined criteria.
2. Multi-Criteria Decision Analysis (MCDA): MCDA is a systematic approach that integrates various criteria and assigns weights to them based on their importance. Potential sites are ranked and selected based on their overall scores.
3. Hydrogeological Studies: Conduct hydrogeological investigations to assess groundwater flow patterns and the potential for contamination. Sites with low groundwater vulnerability are preferred.
4. Environmental Impact Assessments (EIA): EIAs evaluate the potential environmental effects of landfilling activities. They consider factors such as water quality, air quality, biodiversity, and social impacts.
5. Public Consultation: Engage with local communities and stakeholders to gather input and address concerns. Public acceptance is crucial for the long-term success of landfill sites.
6. Feasibility Studies: Conduct feasibility studies to assess the technical, financial, and operational aspects of potential landfill sites, ensuring they are practical and sustainable.
7. Legal and Regulatory Compliance: Ensure that selected sites meet all legal and regulatory requirements for waste disposal.

In conclusion, the selection of landfill sites is a complex process that involves considering various criteria and applying specific methodologies to minimize environmental harm and protect public health. A holistic approach that integrates environmental, social, and regulatory factors is essential to make informed decisions and ensure the sustainability of landfill sites.

REFERENCES

1. Белоселский Б.С. Технология топлива и энергетических масел: учебник для вузов. – М.: Издательство МЭИ, 2003. – 340 с.
2. Лотош В.А. Способ и технология утилизации твердых отходов производства минеральной ваты // Известия Томского политехнического университета. 2004. Т.307. №6. С. 89-92.



3. M.N. MUSAYEV. SANOAT CHIQINDILARINI TOZALASH TEXNOLOGIYASI ASOSLARI O'ZBEKISTON FAYLASUFLARI MILLIY JAMIYATI NASH RIYOTI TOSHKENT – 2011.231 bet.
4. Al-Salem, S. M., Lettieri, P., & Baeyens, J. (2010). Recycling and recovery routes of plastic solid waste (PSW): A review. *Waste Management*, 30(11), 2625-2643.
5. Giddey, R., Kumar, A., & Shastri, Y. (2019). Environmental impacts of waste disposal at landfill sites: A review. *Sustainable Environment Research*, 29(1), 17-32.
6. Kaza, S., Yao, L., Bhada-Tata, P., & Van Woerden, F. (2018). What a waste 2.0: A global snapshot of solid waste management to 2050. Urban Development Series. World Bank Group

