

EVALUATION OF MUNICIPAL LANDFILL SITES IN THE EASTERN ECONOMIC CORRIDOR (EEC), THAILAND USING GIS-BASED MCDA-APH APPROACH

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KEY WORDS: Municipal Landfill Site, GIS and Multicriteria Decision Analysis, Eastern Economic Corridor (EEC)

ABSTRACT: The Eastern Economic Corridor (EEC) initiative in Thailand has led to increased industrialization and urbanization in the region. Being a hub for both industry and tourism encourages interprovincial and international migration, population growth, and commercial and industrial development. As a result, the amount of waste in the EEC has increased significantly. Chonburi, the province with the highest population density in the EEC, generated around 1,594.23 tons of waste per day in 2022, and this quantity is expected to rise further as the city and economy grow. However, the current capacity for waste management in the city is inadequate. There are only three landfills in Chonburi that comply with the standards while eight additional landfills are not authorized. Rayong, the other province in the EEC, is also dealing with the same issue. There are five landfills, two of which are illegitimate dumps. Due to the EEC's limited capacity for waste management now, landfill disposal, a conventional waste management strategy, and the least-priced method of garbage disposal, is considered for dealing with an increase in waste generation in this study. The GIS-Based Multi-criteria Decision Analysis using Analytic Hierarchy Process (AHP) was employed to locate suitable landfill sites in Chonburi and Rayong, the provinces with the highest waste generation rates in the EEC. Eight variables; land use, slope, soil type, distances to settlements, highways, surface water sources, archaeological sites, and nature conservation were taken into consideration when choosing the location. Each criterion was initially assessed separately using the rating approach. An analytical hierarchy process (AHP) was then used to establish the relative relevance of the criteria to one another. Based on the final suitability scores, a landfill suitability map was created and graded into five categories. In Chonburi, 0.36% of the area was most suitable, 4.72% was suitable, 14.60%, 59.40%, and 20.92% were moderate, low, and least suitable, respectively. Similarly, in Rayong province, 0.24% of the area was rated as the most favorable for landfill siting, 6.46% as suitable and 16.63% as moderately acceptable, 64.26% as less suitable, and 12.41% as absolutely unsuitable. This suggests that most of the areas in the EEC are only marginally to barely suited for siting landfills. So, fewer landfills should be constructed in the EEC. In this study, all present dump sites in Chonburi and Rayong provinces and the landfill suitability map were also compared and all of the current disposal sites were found to be in low to least acceptable zones. This suggests that even though landfills are economical, they are not the best option for the EEC to handle the rise in waste. To keep any negative effects on people and the environment to a minimum, it is important to remove unapproved disposal sites and properly evaluate and manage the ones that are already in operation. Additionally, it makes sense to employ a cutting-edge method for gathering carbon dioxide and methane at landfills to produce sustainable energy. As well as considering enhancing incentives and extending waste reduction initiatives to minimize rising waste in the EEC.