Site Suitability Analysis and Risk Assessment of Petroleum Filling Stations in Umuahia Metropolis in Umuahia North l.g.a Using Gis Technique.

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SUMMARY

The rapid growth in urbanization has produced greater demand of vehicles, which results in more fuel consumption. A petrol filling station is a facility catering for need of vehicles and home appliances. The location of petrol filling station is important as it poses a potential risk to the environment and humans. The study aimed at performing a site suitability analysis and risk assessment of petroleum filling stations in Umuahia metropolis in Umuahia north LGA using GIS and Remote Sensing techniques. The aim was achieved through the following objectives: to investigate the factors for suitability analysis of petrol filling station based on physical planning standards of Department of Petroleum Resources (DPR); to carry out the site suitability analysis of petrol filling stations; to assess the factual condition of petrol filling stations distribution based on suitability analysis results and to produce a site suitability map of petrol filling stations in the study area. The methodology involved the acquisition of Landsat 8 satellite imagery and coordinate points of petrol filling stations. Features were extracted from the satellite imagery; spatial distribution analysis and suitability analysis were carried out in ArcGIS 10.2 software. The proximity tool in Arcmap was used to carry out the suitability analysis using buffer distance stipulated by DPR's physical planning standards. The results revealed that there are 33 petrol filling stations located along the 12 roads in the study area. There is 61.5% compliance of petrol filling stations in the study against the physical planning standards. 42% of petrol filling stations satisfied the minimum requirement of 15metres distance from the road. Equally 100% of the filling stations met the minimum distance of 100meters from the health care facilities. However, 24.2% of petrol filling stations met the criteria of 400meters minimum distance to other stations where located on same road side and when not separated by any road or street, while about 88% of petrol filling stations met with the criteria of 100meters from schools. The study and results achieved is important and beneficial; and is recommended as a decision support system in town planning scheme for future development and policy formulation.
