

Site Selection of Electoral Polling Unit Using Geospatial Technology for Zaria, Kaduna State Nigeria

Kaka Atta, Taiye Adewuyi, Musa Abubakar A., Olalekan Isioye, Lukman Giwa, Abdulazeez Onotu and Ebenezer Akomolafe (Nigeria)

Key words: Access to land; Capacity building; Education; e-Governance; Geoinformation/GI; Implementation of plans; Land distribution; Land management; Land readjustment; Remote sensing; Spatial planning; Young surveyor; Suitability Mapping; Geospatial technology; Electoral polling units; GIS and AHP; and Fuzzy logic.

SUMMARY

This study gives an insight to the site selection of electoral polling unit using geospatial technology for Zaria, Kaduna State Nigeria aimed at creating an appropriate model for citing polling units. For the purpose of this work, a base map, SRTM data, pollution data and Landsat 8 satellite imagery were used to generate the land-use map of Zaria and to as well show the nature of the topography of the study area using ArcGIS 10.1, and IDRISI software. A seven parameters criterion was extracted from INEC objectives and summarized to polling unit proximity to voters, Road accessibility to INEC officials, Land use (public buildings, and open spaces), Clinic proximity, Slope and elevation, GMS masts and Water bodies. The generated thematic maps of these criteria were standardized using fuzzy logic approach. A weight for each criterion was generated by comparing them with each other according to their importance. With the help of these weights and criteria, final site suitability map was prepared. Analyzes of the data to determine a relative suitability for each goal was carried out and finally reclassifying preference into three categories of high, medium and low. Using geospatial techniques (multi-criteria evaluation) in IDRISI selva software, and ArcMap 10.1 to create map of existing polling units, suitability map, and comparison map are the results obtained. Comparison of existing and proposed polling units area was made with the aim of determining areas of similarity and areas of disparity. A final suitability map was created for locations of proposed polling units. It was shown how AHP and GIS can be used to create a suitability model of polling unit sites. The above result showed Zaria has an average of 894,600 square meters (894.600km²) in area and majority of the area at present been used as farmland. The population of registered voters is about 415432 with Sabon Gari LGA having 242276 and Zaria LGA having 173156. The result obtained from the map and validated shows that the suitability map of zaria produced has 0.09 consistency ratio and average of 36% of area not suitable, 56% of area fairly suitable and 8% Suitable (Most of the points which fall within this percentage). Thus, polling units that fell within the not suitable region can be redistributed or removed from the lists, also electoral polling units should not be cited in area that fall within not suitable area/constraints (rock/highland and water), while areas with high suitability are expected to have more polling units. Electoral polling units should not be cited in area that fall within not suitable area/constraints (rock/highland and water).

Site Selection of Electoral Polling Unit Using Geospatial Technology for Zaria, Kaduna State Nigeria (11168)
Kaka Atta, Taiye Adewuyi, Musa Abubakar A., Olalekan Isioye, Lukman Giwa, Abdulazeez Onotu and Ebenezer Akomolafe (Nigeria)

FIG e-Working Week 2021

Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021