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MAN PUNG AND SUITABILITY ANALYSIS OF EXISTING ELECTORAL POLLING UNITS 11-15 SERIES IN KATSINA LOCAL GOVERNMENT AREA OF KATSINA STATE, NIGERIA

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PRESENTATION OUTLINE

- INTRODUCTION
- MATERIALS AND METHODS
- RESULTS AND ANALYSIS
- CONCLUSION AND RECOMMENDATIONS











INTRODUCTION

- Nigeria is one of the largest democracies in the world, with the largest population in Africa.
- The Independent National Electoral Commission (INEC) is responsible for voters registration and conducts of election at local, state and federal level.
- Over 56,872 new polling units created in the country with a of 176,846 (as of 16th June, 2021)









INTRODUCTION cont.

- Decongesting overcrowded Polling Units, dispersing voters as evenly as possible, ease of access to ballot boxes were some of the reasons for new PUs
- This faced a lot of criticism because of alleged disproportionate distribution of the polling units based on rule of thumb rather than scientific approach.











INTRODUCTION cont.

- Related research carried out in the past mostly worked on either:
 - their distribution pattern and their proximity to voters;
 - polling units geodatabase;
 - determination of suitable locations for polling units, etc.
- This study therefore used geospatial technique to map out the existing PUs and create a suitability map to analyse the suitability or otherwise of the existing PUs to aid in conduct of free, fair, peaceful, and credible elections.









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Study area

- Katsina L.G.A. is the capital of Katsina State, Nigeria
- Area: 142 km²
- Latitude 12° 45'N to 13° 15'N and Longitude 7° 31'E and 8° 00'E.
- Projected population 429,400 (NPopC, 2016).
- 12 voters polling wards and 281 PUs











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MATERIALS AND METHODS

• Methodology workflow diagram











MATERIALS AND METHODS

S/N	Data Type	Data name		Date	Resolution/Scale	Source
1	primary	Interview		19/8/20	Not Applicable	INEC office Abuja
2	primary	GPS coordina	ates	4/11/20	Not Applicable	Field
3	secondary	Imagery of	Katsina	10/2/21	30m	USGS Website
		LGA (Landsat8)				
4	secondary	SRTM		10/2/21	90m	USGS Website









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MATERIALS AND METHODS

Fuzzy membership value in metre assign for each factor

Factors	Α	В	С	D	
Hospital	100	600	800	>1000	
School	50	400	700	>1000	
Settlements	100	500	700	>1000	
Highway	200	500	700	>1000	
Major road	100	400	800	>1000	
Other road	100	400	700	>1000	
Police station	100	400	800	>1000	









MATERIALS AND METHODS

Weight matrix showing a comparison of each factor against one another.

Factors	HW	MR	OS	OR	SH	SM	HP	SD
Highway (HW)	1							
Major road (MR)	3	1						
Open space (OS)	8	5	1					
Other road (OR)	3	3	1/5	1				
School (SH)	5	4	1/2	4	1			
Settlement (SM)	3	3	1/3	3	1/3	1		
Hospital (HP)	5	3	1/5	1/3	1/3	1/2	1	
Slope degree (SD)	1/3	1/3	1/9	1/3	1/9	1/3	1/3	1







RESULTS AND ANALYSIS

- Queries of geodatabase of existing polling units
 - A geodatabase of total of 281 polling units;
 - ✓ Different attributes such as polling unit ID and wards within the study area, etc.

SURVEY

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RESULTS AND ANALYSIS

• Existing polling units in Katsina LGA











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RESULTS AND ANALYSIS

 Spatial spread of the existing polling Units











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Fuzzy logic of other roads factor











Analytic hierarchy process

- The eigenvector of weight derived from the matrix consistency is given as; Highway_fuzzy_map.rst: 0.0351; Major_road_fuzzy_map: 0.0521 Open_space_fuzzy_map: 0.3280 Other_road_fuzzy_map: 0.1144 School_fuzzy_map: 0.2349 Settlement_fuzzy_map: 0.1297 Hospital_fuzzy_map: 0.0806 slope degree: 0.0252
- Consistency ratio = 0.09, consistency is acceptable (based on existing literature as reported by WC Wedley









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Reclassified of suitability map











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Ν 7°34'0"F 7°35'30"F 7°37'0"F 7°38'30"F 7°40'0"F 7°41'30"E SUITABILITY MAP OF THE STUDY AREA 13°5'30"N 13"5"0"1 13°4'0"N 13-30-N 13°2'30"N 13"2"U"N 12°59'30"N 13°1'0"N 13°0"30"N Legend Z"59'0"N 0 polling units **RECLASS MAP.rst** <VALUE> SCALE 1:100,000 57'30"N Highly un suitable 57'0"N 10 Un suitable 2 Kilometers Suitable higly suitable 7°34'0"E 7°41'30"E 7°35'30"E 7°37'0"E 7°38'30"E 7°40'0"E









Validation of the results obtained

Classes	Percentage (%)	No of Polling Units
Highly Suitable	21	59
Suitable	27	76
Fairly Suitable	26	73
Unsuitable	16	46
Highly not Suitable	10	27











CONCLUSION

- Polling units geodatabase was created, with a total of 281 polling units showing their names, ward, ID, and location.
- Dispersion, clustering, outliers and PUs confined to built-up areas were analysed.
- 10 polling units were highly not suitable, 16 not suitable while about 26 polling units fell within the fairly suitable,











PROBLEMS ENCOUNTERED

- Difficulties in locating some polling units using the addresses given.
- Hoarding of other relevant attribute data by INEC (though they described such as sensitive and not for public)











RECOMMENDATIONS

- Adopt a (geospatial) scientific method in citing subsequent polling units, rather than rule of thumb.
- The independent body should also make more attribute data available for further research.
- Decongest clustered polling units, and use proper suitability analysis to relocate them to a suitable location.









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Thank You for Listening

Dziękuję za wysłuchanie

Jama`a muna godiya kwarai

Full paper is available on Survey Review Journal: https://www.tandfonline.com/doi/full/10.1080/00396265.2022.2100956









