Introductiuon

The success of any business and or economy depends on infrastructural development. It is known that GIS based maps provide the most significant resource for spatial analysis. Both spatial and non-spatial data works in tandem to provide an integrated data that solves some problems of geospatial analysis and business decision making (Kamil, 2007).

The aim of the project is to study the growth and trend of urbanization around city/town, as well as to find out the suitability sites for further urban development around the city/town. Urbanization has continuous demand of land as a resource which is very limited especially in urban areas. To cop up with Rapid urbanization and consequent haphazard growth of urban cities land suitability plays vital role in urban and rural planning , environment and regional planning.

Analysis of suitable land parcel is the prime importance in the field of planning to carry out sustainable development ,thus Missouri has been considered and its suitability map is prepared, visa vis , the placement of student hostels in areas that meet specific criteria. Best locations for student hostels while considering environmental sustainability using QGIS and machine learning models will allow for the optimization of the process of land suitability analysis.

LITERATURE

Shan (1999) applied remote sensing and GIS technologies for analyzing the dynamics of urban spatial structure in Shanghai. Multi-temporal land use information of the central city of shanghai was obtained by the interpretation of aerial photos of 1958,1984 and 1996. Based on Arc/View GIS GIS concentric and sector methods, a conceptual model of spatial structure of Shanghai was brought forth. Soa (2000) carried out a study to prepare location map of selected urban facilities and services using GPS technology and identify the service area of different facilities and services, which will be the inputs for preparation of comprehensive development plan of the city.

(Herlawati et al., 2020) proposes a geographic information system (GIS)-based method to analyze the proper central business district in Karawang, Indonesia. Using a weighted sum method in a model,a multi-criteria analysis of factors affecting the candidate locations was used to find the optimal place. Furthermore, the spatial data retrieved were analyzed using a GIS tool to classify region into urban, peri-urban, and rural. The experiment concluded with two central business locations found near the toll gates after reclassification. These two locations were which had the potential to become the new central business locations were at the north of Karawang .

The study by (Shah Pooja et al., 2020) identified suitable land which has high potential to satisfy future urban needs of Surat regions, a city in western part of India. Multispectral Image (LISS IV) was used to extract the Land cover map of the city thereby generating the slope and elevation maps. Land suitability analysis was subsequently performed using weighted overlay tool of GIS and weights were obtained by Analytical Hierarchy process (AHP) considering socio-economic, utilities, environment and physical as main criteria. The result indicated that 82.93 sq.km (8.56%) area is very suitable, 128.84 sq.km (13.30%) is suitable, 749.82 sq.km (77.37%) is moderately suitable, 6.43 sq.km (0.66%) is less suitable and 1.07 sq.km (0.11%) is unsuitable for the future development.

OBJECTIVES

The objective of this project is to enable end users compare locations in a geographical region based on set criteria. The locations to be determined would be Student Hostel. These criteria will furthermore be used to generalize to evaluate site suitability for all kinds of physical localities like Hotel, Logistics (Human and Goods) and Retail sites. This would subsequently aid in making appropriate business decision for that said location and thus improve the target market .

Additionally, these locations will be classified into General, High and Special value. Finally, the machine learning model used to complete this project would allow for the elimination of human bias when selecting sites for development.

STUDY AREA

St. Louis ,Missouri

Male population over 15 years

Female population over 15 year

Housing units (occupied and vacant)

Educational institutions (colleges and graduate schools)

Commercial land

Healthcare facilities

Prisons and graveyards

Student population (enrolled/not enrolled)

Methodology

The problem statement is to identify potential Land suitable for urban growth via the construction of student hostels by the use of geospatial analysis techniques. The proposed methodology comprises of a detailed study under literature review to understand modernization through the construction of student accommodations.

Map data was gotten using OpenStreet Map (OSM) with census data taken from ( …… ). The attributes/criteria used in the project are proximity to roads, grave yards, highways, income etc.

What is OSM?

What is QGIS

A county is an administrative or political subdivision of a state that consists of a geographic region with specific boundaries and usually some level of governmental authority

Census Tracts are small, relatively permanent statistical subdivisions of a county or statistically equivalent entity that can be updated by local participants prior to each decennial census as part of the Census Bureau's Participant Statistical Areas Program (PSAP)

A block is going to be an average distance of what it takes to get from one street to the next in a city. In most cities, a block is going to be about 315 feet. This will vary depending on when and where the city was built.



DATA COLLECTION AND PROCESSING

Data was collected in 2 ways, via OpenStreat Map (OSM) and cencus data.

Open Streat Map (OSM) was used through a plug-in called QuickOSM in QGIS. The Geospatial data was then querried and downloaded via this plug-in as geo-json files. The features of the specified region (ie St. Louis was then accessed. This showed the land use pattern (ie. residential , commercial, retisl or religionus or military) educational,event centers,health care facilities, primary highways ,hotels,sports transportation, tourism etc using key-value pairs. These key-value pairs was gained from the OSM wiki page and with it the required data was querried and downloaded.

Furthermore, cencus data was gotten from the US cencus bureau website. this was accessed using 4 important topics namely , the population of the region,the household data such as income employment status, commuting to work etc. economic features of the population like rent, housing etc was also access . Social characteristics of the population was also access.

For population the number of , children, males and females, housing characteristics, economic characteristics and social characteristics. These information was gained using the American Community Survey (ACS) System.

Data was collected and cleaned from the cencus.gov. A website that contains details information relating to states. Now, the data collected from the cencus website have geographic identifiers. These identifiers contain 15 or more numbers. The first two (2) numbers represent the state, while the next three (3) represent the county. This is followed by the census tract which is a six (6) figures and finally the block. The last four(4) numbers contain the “block”.

Now, St. Louis which was the Region of Interest (ROI) has latitude and longitude '38.64637086326608', '-90.25510266733917' respectively.

EXPERIMENTATION

CONCLUSION AND FUTURE WORK

REFERENCE

Shan Z., 1999 Remote sensing and GIS as a tool in exploring the dynamics of urban spatial structure: The case study of shanghai city. Proceeding of the 20th Asia Conference on Remote Sensing was held on November 22-25, 1999 in Hong Kong China.

Jain K. 2007 Site Suitability Analysis for urban development, Journal of Applied Sciences 7 (18): 2576-2583,2007