

Using Remote Sensing and Geographical Information System to make Baghdad more beautiful

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Abstract The ground of Remote Sensing and Geographical Information System (GIS) has become interesting and attractive with expanding opportunities. It provides critical tools that can be used at various levels to guide decision-making toward long-term sustainability, which in this paper, remote sensing application has used in GIS various fields. These fields such as urban plan city, education, economic development, and natural resource conservation. GIS and remote sensing technology have seen rapid growth over the last decade. This paper presents the most commonly used processing procedures for remotely sensed data, specifically image processing algorithms, as well as the application capabilities of GIS technologies. A study was conducted for the purpose of identify and mapping the temporal variability of land cover types prevalent in Baghdad Governorate using remote sensing and GIS techniques. Because of classified urban areas has increased continuously with time of the shortage and other factors in the category of water bodies over time. For this reason, we first presented processing procedures for remotely sensed data, specifically image processing techniques, as well as the application capabilities of GIS technologies. to reach the develop urban area, given green belt around Baghdad as result, second put the steps of the of urban area plan as show in Figure 1.



 Crossref  [10.36371/port.2023.special.7](https://doi.org/10.36371/port.2023.special.7)

Keywords: Remote sensing, GIS, The Remote sensing Application, Baghdad City,

1. INTRODUCTION

Remote sensing and Geoinformatics (RSGIS) are two trends that are used in conjunction to design, capture, store, manage, analyze, try to influence, and present geographic or spatial data. They are used in identifying patterns and predicting changes that have taken place in various themes to help in strategic planning. GIS and remote sensing technologies, in particular, provide the ability to rapidly collect data, process and integrate data and information, and then display the outcomes in geo - spatial maps and reports

Remote sensing and geographic data systems (RSGIS) have developed into exciting and glamorous fields with rapidly expanding opportunities [1].

These technologies provide resource managers with tools for analyzing and comprehending an ecosystem, allowing decision makers to better visualize, combine, and quantify available resources. Data in this paper we will describe remote sensing, GIS to show the effect of factors over time on the surrounding area in a city of Baghdad. Also, this will apply for other application that related to them which increased in different filed to seam imported the in life which Urban Planning of Baghdad governorate.

2. REMOTE SENSING.

Evelyn Pruitt coined the technical term "remote sensing" in 1958 at the United States Office of Novel Research (Estes and Jensen, 1998). It is the to obtain reliable information, the process of recording, measuring, and analyzing imagery and digital representations of energy patterns derived from nonintrusive sensor systems. about physical objects and then ironmen [2].

Remote sensing is the umbrella term for all methods that use some kind of recording device going to record, measuring, and translating imagery and digital representations of energy so according from non - contact sensor systems in order to obtain credible data devices. It is defined as the science and technology that allows the characteristics of objects of interest to be recognized, evaluated, or analyzed without direct contact. The process of recording, measuring, and translating imagery and digital energy patterns derived from noncontact sensor systems in order to avail dependable information about physical objects and the climate is referred to as remote sensing. These remotely collected data from various sensors can be analyzed to learn more about the objects or features being studied.

3. GEOGRAPHIC INFORMATION SYSTEM.

Is an information service input, store, retrieve, deceive, analyze, and output geographically referenced or spatial data

GIS uses these functions to help with spatial management and planning of land use, natural resources, the surroundings, transportation, urban facilities, and other government data. Environmental sustainability that is both responsible and effective is required for the protection, conservation, restoration of the natural surroundings. This type involves systems designed to capture and process spatial data. The data in a GIS is the contents of its database, which is typically made up of data planes derived from different data sources. The combination of remote sensing and geographic data systems allows data interpretation (GIS). This combination has evolved into an exciting and glamorous field with expanding rapidly opportunities. A data plane is made up of only one type of data, such as digitized elevation data. A large data must be handled to effectively manage tropical techniques. Those in charge of these resources' overall management require quick access to the maps and statistical data. Manual interpretation can incorporate a small supply of field data, maps, and aerial imagery [3]. A geographic information system (GIS) is a computer system that combines spatially referenced facts with imagery obtained through remote sensing. GIS can also be used to improve data extraction from remotely sensed data. One of the most common methods for collecting physical data for GIS assimilation is remote sensing detect objects on Earth without any direct contact.

4. THE IMPLEMENTATION.

After the description of the remote sensing and GIS system, we will discuss an example about the Urban Planning, Development and Management.

The input of remote sensing and GIS The benefits to urban planning, advancement, and management are enormous. Administration, development control, plan making, and strategy development are some of the functions, scales, sectors, and stages involved in urban planning. Several other applications have applied the technology to urban growth; urban change detection; land use/land cover study; urban sprawl mapping and measurement; urban facilities distribution and the generation and creation of an accurate urban land use map

Geographic information systems (RSGIS) and remote sensing have been used to model, quantify, predict future urban phenomena (see figure 1). The combination of these technologies can calculate fracturing, patchiness, porosity, patch density, interspersed, relative richness, diversity, and dominance in the environment. Remotely sensed data provides a robust source of spatial attributes of structure.

Determined the spatial growth, rate and direction of growth. Future growth projection and the possible effects of the growth on Benin urban environment were determined from their analysis. They discovered that the Absolute

development over the last 18 years was 115.5785 square kilometers, with an annual rate of growth of 5.5 square kilometers. Based on their findings, they advocated for ongoing checking of urban expansion and its direction through the use of integrated remote sensing and GIS reaches [4]. Figure 1 shows the planning process.

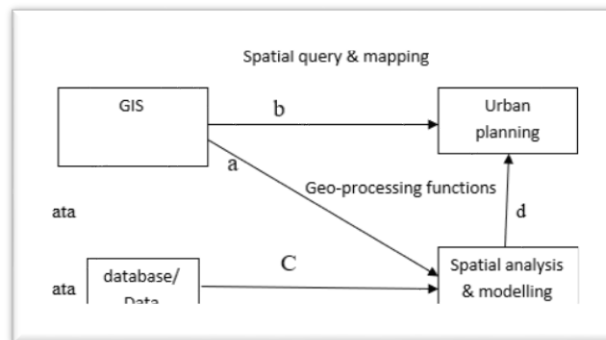


Figure 1. GIS and urban planning

To show the steps of the planning in Figure 1, we follow the following:

- In a database-driven GIS.
- Using the geo-relational model, spatial and verbal data can be stored and connected. Existing GIS software allows for efficient data retrieval, querying,
- and mapping. Planners can also extract data from their databases and feed it into modeling and spatial analysis software.
- Geographic When merged with data from other tabular databases or specially performed surveys, information can be used to make proper planning decisions.

5. RSGIS ADVANTAGES IN URBAN PLANNING.

- The advantages of RSGIS in Urban planning are the following:
- Magnified Thematic Mapping GIS and Remote Sensing improved the efficacy of thematic mapping and data storage.
- Improved information access Desktop GIS simplifies the storage, management, and access of data from various sources.
- Improved the quality and efficiency of public services - GIS can help with this allowing information to flow freely between government agencies.
- Enabling free flow of information between government agencies Increased support for making strategic decisions more quickly. Planners can create more effective strategies leading to stronger, built-for-any-city cities if they have access to a broader range of important geographic information.

- f. Better communication system for data storage and management, allowing users to access information immediately rather than having to sift through it.

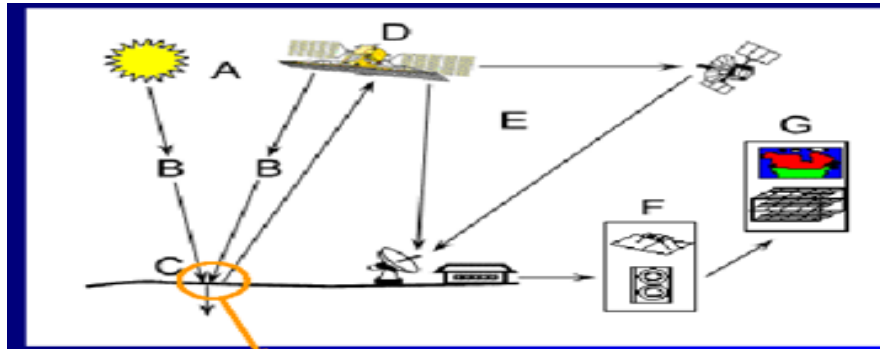


Figure 2. shows the steps how RS,GIS systems work together for Urban area.

Figure2 GIS and RS for urban area

A stand for energy source or illumination.

B stands for Radioactivity and Atmosphere.

C stands for Attached Regarding (Baghdad a government).

D stands for Sensor Energy Recording.

The letters

E. is the combination of transmission, reception, and processing (sooner).

F stands for Observation and Understanding (image and database in computer).

G is Implementation (database and analysis) (database and analysis).

6. URBAN PLANNING OF BAGHDAD GOVERNORATE USING RSGIS.

This study was conducted for the purpose of identify and mapping the temporal variability of land cover types prevalent in Baghdad Governorate employs Techniques for remote sensing and Geographical Information Systems (GIS). This satellite image was seen for the sensor Spectroscopic

Scanner (MSS) images with a spatial resolution of 60 meters and four spectral bands. The Thematic Mapper (TM) is an advanced multispectral scanning Earth resources sensor that is designed to achieve higher image resolution. OLI (Operational Land) Imager taken in the springs season in the third month in order to reduce the impact of abandoned and uncultivated land on the SAVI Index values in the years 1976, 1990 and 2016. Index calculation was used to determine the dominate There are several types of land cover in area. The results of the directed classification revealed of five types of land cover that are repressed by water bodies, abandoned lands, urban areas, density vegetation and dense vegetation. Whereas when using the SAVI guide(Attempts to minimize the effects of bare soil the SAVI method), the result indicated the present of four classes of lands covers including water bodies, abandoned lands, urban areas, density vegetation and dense vegetation land covers types see Figure 3. Figure 4, The results of the directed classification showed a decrease in the category of water bodies over time, as it 2,8% and 1,5% in the years 1976-1990m respectively and in the year 2014 the percentage increased to 2.1%.

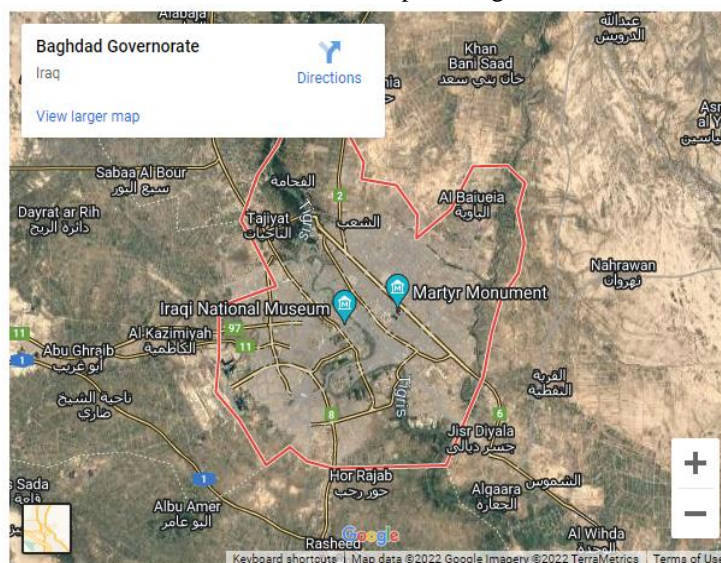


Figure 3 .Baghdad Government



Figure 4. Baghdad Government(Graph)

What classified urban areas has increased continuously with time, as the percentages constricted 17.6%, 23.5%, and 28.2% for the years of study, which indicated of urban encroachment, while the abandoned areas constituted 29. For the years studied, the percentages were 23%, 26.8%, and 35%, respectively. The low-density category fell from 44.8% to 40% and 3.1% in 1976, 1990, and 2014, the percentage was 29.4 percent. The dense plants category increased from 5.5

percent to 16.4 percent between 1976 and 1990, then decreased to 6.8 percent in 2014. SAVI played a role in the discovery of 'agricultural lands' and produced results that are similar to those of directed classification. The findings confirmed that urban sprawl and soil erosion Stalinization processes are among the most negative aspect of agricultural land areas see Figure 5 and Figure 6.

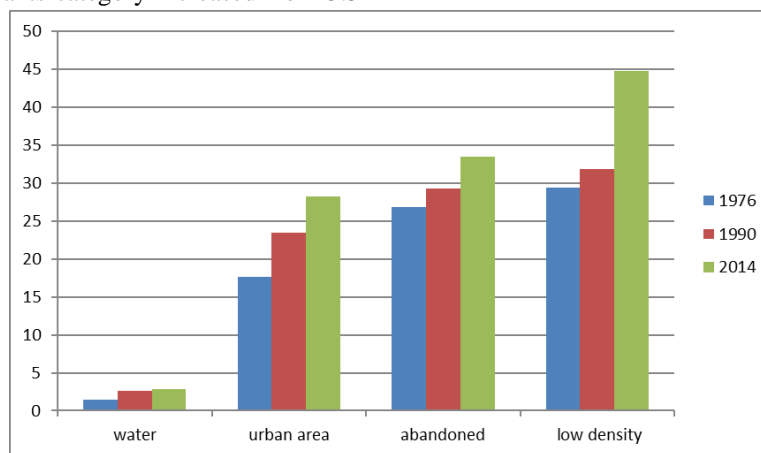


Figure 5. Graph of water, urban are, abandoned and low-density category of green area

D	C	B	A	
2014	1990	1976		1
2.8	2.6	1.5	water	2
28.2	23.5	17.6	urban area	3
33.5	29.3	26.8	abandoned	4
44.8	31.8	29.4	low density	5

Figure 6. Data of water, urban are, abandoned and low-density category of green area

7. RESULTS.

The category of areas has increased continuously over time without planning, which indicates the existence of the phenomenon of urban sprawl, which puts great pressure on

the availability of necessary services, while the abandoned areas formed large proportions of the land. A decrease in the category of water bodies over time, the absence of using remote sensing and geographic information systems as, can obtain geographical images and obtain a database on a city.



The concerned authorities, increase human beings depended can return steps new planning for Bagdad city and urban areas, and increase green areas and water to provide services.

8. CONCLUSION.

The Remote Sensing and Geographic Information System (RSGIS) is a type of geographic information system. Avery

important system in Urban Planning, Development and Management that affect over life. In this study of Urban Planning of Baghdad Government by using remote scenes and GIS (RSGIS) that different areas affected over time. The results shown that it is required to leads to the development of all areas of civilized, residential, green areas and water space for the coming years.

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