

# Sustainable Development Using GIS (Geographical Information System)

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**Abstract**—Sustainable development is a process that meets the needs of present generation without compromising the ability of the future generation to meet their own needs. Sustainable development is the balance of meeting humankind present needs and protecting the environment for fulfillment of future generations needs.

*The growing human population and its demands on the earth resources generate huge needs and required sustainable practice. Developing country like India have many urgent needs and objectives which can be mutually conflict and the use of resources can be competitive for this we needs regular monitoring practice, best way management of resources and Identifying problem.*

*GIS is becoming the important tools to use for sustainable development as we seek to maximum the efficiency of the environment around us. GIS can be great use because of its integrating power and ability to bring together different data from variety of sources in to one simple, to use graphic and database format. GIS includes the modelling and visualisation in order to decision making not only for current state of the resources it can also be done for future state of resources. It is very quick and easy to compile, manipulate and present to a broad range. GIS can be used for many fields like sustainable development in agriculture forest management, land use land cover etc. GIS maps are very interactive and for the end use a visual image is the best output.*

## 1. Introduction

The term Sustainable Development can be interpreted in many different ways but the core meaning is the balance between meeting humankind's present needs and conservation of environment for the fulfilment of future generation needs. A report issued by the World Commission on Environment and Development (the Brundtland Commission) in 1987, according to this Sustainable Development is defined as "Development that meets the needs of the present without compromising the ability of the future generations to meet their own needs". Sustainable Development combines two parts "Sustainable and Development". Sustainable means all resources should be used in such a way that which fulfil our requirement for sustain on the earth surface. Development consider development of people, environment and economy. Sustainable development is all about finding best way of doing things for present generation and for future also, It doesn't mean quality of life will be reduce for present. It means rebuilt

what has been lost. For e.g. Many university is allow only one vehicle which is bicycle inside the campus instead of using car or other motor vehicle which is improve the health and environment also. Developing and diversity country like India has many urgent needs and objectives to full fill their needs without overuse of resources is difficult, for this we needs regular monitoring practice, best way management of resources and Identifying problem. GIS is becoming the important tools to use for sustainable development as we search of maximum efficiency of the environment around us. GIS is a powerful set of tools which is collecting, storing, analysing and transforming in a understandable manner. GIS plays key role for decision making not only for current state of the resources it can also be done for future state of resources. GIS can be great use because of its integrating power and ability to bring together different data from variety of sources in to one common visual language.

## 2. GIS (Geographical Information System)

Geographical Information System is associated with Geographical and Information System All types of data which is directly or indirectly related to earth is called Geographical data and when these data is used for planning then its turns into information which can be presentable in a useable manner according to our needs. GIS it is set of powerful tools for collect, store, manipulation analyze, manage and display.

### 2.1 Components of GIS

- 1) Computer system (hardware and Operating System).
- 2) Software like Arc GIS, Qgis, Erdas Imagine, LiDAR
- 3) Spatial data and Attribute data.
- 4) Data management and analysis procedure and
- 5) Person to operate the GIS (Planning/ Development purpose).

GIS has ability to bring together different sources of data into one simple. GIS inputs data can be all aspects of capturing spatial data and the attribute data. Attribute data added Information for the spatial data.

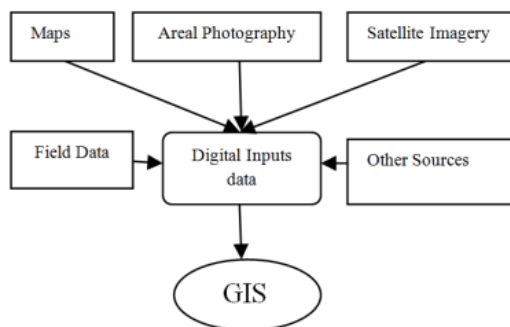


Figure 1: GIS inputs data

India like country where the population is increasing day by day and their needs. GIS can be used as a great tools for regular monitoring, Identifying problems and solving, best way of management and decision making by visual interpretation of data as a result for development plan for sustainable development.

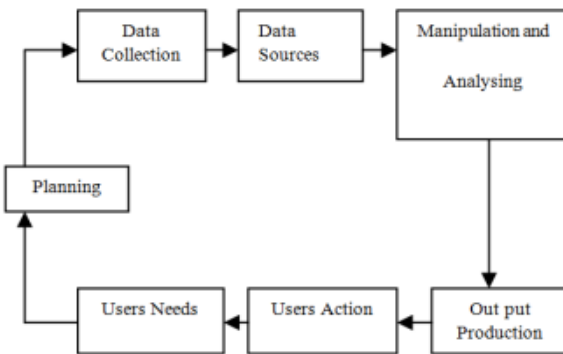


Figure 2: Simplified information system

In many country GIS is used for many application separately for best way of management and development purpose. As a sustainable development means steady development of people, economy and environment. All these sectors are related to each other. GIS has been using separately for development purpose from many years through GIS analysis. It means vast area of development which can consider as a large amount of data. GIS has capability of integrating all spatial and attributes data and generate action plans or development plans for sustainable development.

Few type of analysis like Example.

- 1) Overlay analysis (e.g. we can find out hospital near to highway, School near to residential area)
- 2) Buffering and Neighbourhood analysis (e.g. Buffering between these two layers Dumping ground and school , Agriculture land and Water bodies ,Industrial area and Educational Institute) .
- 3) Surface Analysis ( e.g. Slope analysis, TIN analysis)

- 4) Network Analysis (e.g. Highway, roadways, canals, transportation routes, garbage collection, mail delivery, sewage, water supply)

### 3. Sustainable Agriculture Using GIS for example.

Agriculture is one of the oldest occupation people started growing crops for their basic needs and its depends on the traditional way like irrigation based on rainfall, river water, well etc. Agriculture area increasing gradually more because of people needs started using pesticides more fertilize to produce more crop. Were agriculture land is not available according to our needs people started burning forest and started doing agriculture.

Sustainable Agriculture is main aim is to Identify unplanned agriculture practice area and area of overuse of natural resources. In identify unplanned agriculture practice area. 1)Land depends upon traditional way of irrigation.2)Types of crops for particular area of land.3)Gaps between crops season.4)Identification of pest attack and diseases.5)Crop area assessment/ crop production.6) crop area and yield assessment. In area of overuse of natural resources.1) Soil health .2)Excess use of fertilizer. These are the main area need to work with GIS and gradually we can do sustainable agriculture.

### 4. Conclusion.

Today by using GIS and its analyzing process helps for development in every sector in different levels, like for examples- agriculture, human live urban planning , forest. According to current situation we need to gradually close to advance technology like GIS.

In GIS research mostly based on visual Interpretation which is easy to understand every one. This technique increase awareness among people. Most useful tool for GIS is while development we can find out the surrounding environment. Collecting data, making development plan while implementing plan tools able to do evolution check also can be done by GIS tools.

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