SUSTAINABLE DEVELOPMENT BY GIS

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Abstract: *Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts, the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs. Sustainable development is maintaining a delicate balance between the human need to improve lifestyles and feeling of well-being on one hand, and preserving natural resources and ecosystems, on which we and future generations depend. GIS organizes geographic data so that a person reading a map can select data necessary for a specific project or task. GIS can be an important tool for helping people map out plans for successfully achieving management strategies that are sustainable both at local and global levels. A good GIS program is able to process geographic data from a variety of sources and integrate it into a map project. Many countries, except ours, have an abundance of geographic data for analysis. GIS is a key tool used in assessment, prioritization, mitigation, planning, science and training. Economic inequality, social instability and environmental degradation are common features of unsustainable development. Poor people bear the brunt of these problems because their livelihoods are precariously balanced on volatile economic opportunities and environments vulnerable to change. What we need is a national strategy for sustainable development (strategic and participatory process of analysis, debate, capacity strengthening, planning and action towards sustainable development), a tool to assist the farmers in overcoming their problems and start to strengthen their capacity for sustainable development. Using GIS in sustainable agriculture can lead to great benefits, especially for how they can be seen all the cultures they represent, the soil which are substances in the soil, availability of water, crop rotation, pests.*

Key words: *GIS, sustainable development, maps*

INTRODUCTION

Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations. The term was used by the Brundtland Commission which coined what has become the most often-quoted definition of sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing humanity. As early as the 1970s "sustainability" was employed to describe an economy "in equilibrium with basic ecological support systems." Ecologists have pointed to The Limits to Growth, and presented the alternative of a "steady state economy" in order to address environmental concerns.

GIS (Geographic Information System) is an information system based on the computer, which uses digital representation and analysis of geographic features that are present in surface and ground events that occur on them. The meaning of digital representations is the conversion of analog form (continuous line) in a digital.

MATERIAL AND METHODS

GIS represents the combination of data content and indexing management, with spatial representation and analysis techniques to facilitate understanding of real world entities and interactions between them. An advanced GIS requires two main components, the hardware and software, subordinate to a third, the human. GIS with remote sensing can produce digital maps of cover/land use, hazard and risk maps of floods, droughts, demarcation maps of areas affected by disasters. However, the results of a GIS is not limited to maps, using such a system can be obtained dedicated thematic GIS databases, products derived from GIS layer-info and most importantly, estimation of data.

RESULTS AND DISCUSSIONS

"Every object present on Earth can be geo-referenced" is the cornerstone of any GIS databases. The database is a collection of information about things and combinations of these, Geo reference refers to the location of a level or coverage in space, defined by a referential coordinate system.

A GIS is a computer system designed to work with data referenced by coordinates spatial/geographical, which is both a database system with specific capabilities for spatial reference data and a set of operations that work with these data. He is often considered a high-level map.

GIS technology integrates common database operations such as query and statistical analysis with unique visualization and geographic analysis benefits offered by maps. These features distinguish GIS from other systems and make it have value to a wide range of people to explain events, forecast results and planning strategies.

Sustainable development is the balance of meeting humankind's present needs while protecting the environment to ensure the fulfillment of future generations' needs. The growing human population and its demands on the earth's resources generate a need for sustainable practices.

Implementing these practices often requires collaboration between different organizations. ESRI's commitment to developing interoperable technology sets the stage for cooperation between organizations so that they can make well-informed decisions. GIS software allows users across the globe to share ideas on how to meet their resource needs, plan efficient land use, and protect the environment to guarantee the survival of future generations.

GIS is an important tool for helping people map out plans for successfully achieving management strategies that are sustainable both at local and global levels.

Geographic information systems provide policy makers and planning agencies with visualization tools to manage growth and change. GIS is key tool used in:

- Assessment

- Prioritization

- Mitigation. Mitigating the effects of natural hazards and providing potential risk analysis for communities are common application areas for GIS. Information from a central database can be visualized and analyzed to mitigate areas that are environmentally at risk. The GIS can be used to assess contamination of soil, water, or the atmosphere. With the help of GIS, you can monitor pollution to environment relationships, identify potential risks, prioritize potential pollution scenarios and model the rise of pollution levels over time and predict environmental impact.

- Planning. Geospatial analysis is essential for planning that encompasses the demands of building a hydroelectric dam, planting urban trees to cool down a city, or establishing guidelines for the protection of habitat. GIS tools are essential for performing geospatial analysis. Environmental planning scenarios include waste management plan for best

treatment and disposal site location, most efficient routes for fleet, and analysis of impact on public and land, disaster management response plan for a toxic spill (includes impact areas, infrastructure, what-if scenarios, escape routes, and responder centers), vegetation management plan for a right-of-way corridor that includes a schedule of planting and cutting and generates regulatory compliance reports

- Science. Environmental scientists can use GIS to study change, impacts, and relationships in the environment. GIS is an integral component of scientific methodology, allowing scientists to capture, manage, manipulate, and visualize geographic information. It makes it possible to collect large volumes of information about observable events and build and test theories about geographic patterns and processes that show relational patterns. You can access many types of data from many resources, quantify uncertainty, test hypotheses, perform geographically weighted regression models, perform spatial clustering algorithms and testing in order to determine distribution, visualize cartography and scientific information, perform spatial analysis and modeling, collaborate with many other scientific agencies and of course, publish and serve findings.

- Training.

CONCLUSIONS

A GIS may have the following advantages for the sustainable development:

Project Planning - GIS benefits are often found in the detailed planning of the project, which has many space components, where problem analysis is necessary before starting the project. The system can generate thematic maps based on one or more base maps, for example, generate maps of land use on soil composition, vegetation and topography. It is also possible to calculate areas, lengths and distances.

Decision Making - A GIS is not an automatic decision making but is a tool for query, analysis and layout of the map data used to support decision-making process.

Visual analysis - DTM (Digital Terrain Modeling) is an important tool of GIS. Using modeling DTM/3D, land can be better viewed, this leads to a better understanding of the relationships within that field. Using GIS many calculations and modeling can be done much easier, for example lake volume, the volume of soil erosion, etc.

Improve organizational integration - Facilitating the communication and sharing information, by creating a shared database, data can be collected only once and can be used several times.

As a conclusion, saying “the benefits of GIS” for sustainable development, we can refer to that data are much better organized, are eliminated redundancies in data storage, users have increased productivity and ultimately, analysis, statistics and searches are made much easier and accurate, meaning better decisions.

When referring to the drawbacks, the biggest risk is to forget that digital products aren’t more accurate than maps derived from, that must necessarily be considered to collect accurate data in the field. Incorrect data can lead to larger errors, resulting in a wrong system. And if there’s something not good, the methods and techniques have no fault; everything was started from field work.

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