

Chapter 62

GIS–Based Decision Support System for Village Level: A Case Study in Andhra Pradesh

Subbu Lakshmi Esakki Pandian
VIT University, India

Kiran Yarrakula
VIT University, India

Probal Chaudhury
Bhabha Atomic Research Center, India

ABSTRACT

Decision support system (DSS) plays a vital role especially in rural areas to develop rural sector for sustainable development and socio-economic uplifting of the country. To make appropriate decisions and to develop village economy, decision support system is useful for the mandal revenue officer, collector, Surpanch, and different administrators. It deals both spatial and non-spatial data at village level and comprises various ancillary information including mandal maps and village-wise information of Anantapur and Kadapa districts of Andhra Pradesh such as number of houses, male and female, SC/ST/OBC/general (or) OC population, literate and illiterate population, total working and non-working population. Datasets are collected from district collector office, mandal revenue officer (MRO) and inserted in GIS database. This chapter makes an attempt to build features of various decisions at Anantapur and Kadapa districts by integrating various layers of information at village level.

IMPORTANCE OF DSS AT VILLAGE LEVEL

Geographical information system (GIS) has been developing at a remarkable pace over few decades and plays a vital role in development of nations in the 21st Century. Decentralized planning in India is still in the stage of experimentation. Now it's time for planners and decision makers to discuss the importance of GIS technology and its applications in rural development (Reddy et al, 2011). So there is a need for

DOI: 10.4018/978-1-5225-7033-2.ch062

spatial DSS and its demand is likely to grow. In India 27% of the population resides in urban areas and 73% of population settled in rural area, a proper structured planning procedure is essential such that the infrastructure facilities and development activities are available at both rural and urban area. Since majority of population settled in rural areas are provided with the least infrastructure facilities, creates a regional imbalance in development, that cause migration of people from rural to urban areas. Selwal, 2008 addressed that existing systems make decision making for village developments manually based on information recorded on papers. Such manual process consume time and inefficient to take decision regarding further developments. Previously, lack of proper land records and inefficient judiciary makes concerning system vulnerable to high loss and it demands a system that keeps the accurate record of lands and makes it available in time (Patil 2014; Padma et al, 2015; Vijay Krishna, 2003). Hence decision-makers or administrators require a well organized tool like GIS will help to obtain the updated layout of the region (Kodge and Hiremath, 2012). Adinarayana et al., 2008 proposed a geographical information and communication technology (Geo-ICT) based information system for rural development to assist the user in analysing the rural information for rural development. Patil, 2014 used GIS platform using Gram++ software to assist administrators for village level planning. Asadi et al, 2012 used remote sensing and GIS techniques along with VB. NET for micro level planning and sustainable development of mandals that would be helpful for government officers, planners, geographers and a person who does not have prior knowledge on the software can avail village information at one place. DSS play a huge role in improving school facilities which is very useful for village Sarpanch and parents, district development officers for decision making at appropriate level (Hareesh and Valli Kumari, 2013). Govindaraj et al, 2013 addressed that information system based on spatial data at panchayath level will be useful for proper planning, monitoring, investigation and decision making to provide better public utility services. GIS and remote sensing act as an important tool has greatly reduced the problem by computerization of the spatially correlated data for handling, retrieving, analysis of spatial data and storage (Sitender et al, 2012; Penning de Vries et al, 1991). Sitender et al, 2012 developed information system to examine the status of infrastructure facilities using HTML environment. Kodge and Hiremath, 2012 used open source geospatial tool such as QGIS and web based information system using SQL to extract village level information system. To determine the impacts on future land use patterns, web based information system also known as village information system (VIS) allow planners and citizens to act efficiently and quickly create and examine the scenarios alternative development (Santosh et al, 2009). Some of the service organization such as NIC and ICT application play a vital role in facilitating grass root delivery of GIS based DSS for planning at micro levels and providing integrated spatial and non spatial data services for planning (Yadav and Singh, 2009). Rayed addressed SDSS converts existing datasets into new datasets by applying DSS models, expert system, and artificial intelligence, such data combination provide a model output that provide solutions with spatial relevance. In such a place where spatial and visual representation is important, GIS data play a key role (Rayed, 2010). The present book chapter highlights the power of GIS technology to understand and evaluate spatial data by creating graphic displays using attribute information stored in the GIS database such that the clients can view the information query. It is concluded that people living in rural area urgently needs a GIS based e-governance system in order to help the government in planning, implementation and monitoring of various projects for development of rural areas at a faster rate to develop the state more technologically advanced. The modern technology of remote sensing includes both aerial and satellite based systems, provide easy access to data on a repetitive basis with speed and spatial data can be analyzed together with the help of GIS, generating various options such as modeling, thereby the whole planning process can be optimized (Jhawar et al,

17 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/gis-based-decision-support-system-for-village-level/212998

Related Content

Climate Change and Agriculture: Impacts, Adoption, and Mitigation

Sunil Lalasaheb Londhe (2018). *Climate Change and Environmental Concerns: Breakthroughs in Research and Practice* (pp. 1-23).

www.irma-international.org/chapter/climate-change-and-agriculture/201691

Geographic Information System (GIS) Modeling Analysis and the Effects of Spatial Distribution and Environmental Factors on Breast Cancer Incidence

Akram Gasmelseed and Ali H. Alharbi (2019). *Advanced Methodologies and Technologies in Engineering and Environmental Science* (pp. 320-333).

www.irma-international.org/chapter/geographic-information-system-gis-modeling-analysis-and-the-effects-of-spatial-distribution-and-environmental-factors-on-breast-cancer-incidence/211881

Climate Change and Its Impacts on Oases Ecosystem in Morocco

Mohamed Ait El Mokhtar, Raja Ben Laouane, Mohamed Anli, Abderrahim Boutasknit, Abdessamad Fakhech, Said Wahbi and Abdelilah Meddich (2019). *Climate Change and Its Impact on Ecosystem Services and Biodiversity in Arid and Semi-Arid Zones* (pp. 217-245).

www.irma-international.org/chapter/climate-change-and-its-impacts-on-oases-ecosystem-in-morocco/223764

Potential Impacts of Climate Change on the Inland Fisheries of Arid and Semi-Arid Regions of Africa: Impacts of Climate Change on Inland Fisheries

Imefon Udo Udo and Imekan Isaac Akpan (2019). *Climate Change and Its Impact on Ecosystem Services and Biodiversity in Arid and Semi-Arid Zones* (pp. 196-216).

www.irma-international.org/chapter/potential-impacts-of-climate-change-on-the-inland-fisheries-of-arid-and-semi-arid-regions-of-africa/223763

Climate Change: Vulnerability and Resilience in Commercial Shrimp Aquaculture in Bangladesh

Shaikh Mohammad Kais (2017). *Environmental Sustainability and Climate Change Adaptation Strategies* (pp. 162-187).

www.irma-international.org/chapter/climate-change/170313