Chapter 10
Geospatial Decision Support Systems

ABSTRACT

The chapter is on the geospatial decision support systems. Challenges arise when simple GIS is used to support complex problems encountered at higher level, strategic decision-making, and long-term development planning. In this case, SDI can be more valuable. The chapter presents the perspective of information systems for decision support taking into account the following: the levels of decisions and the process of decision making. Trends on the tools and framework for interactive decision support systems are discussed focusing on geospatial decision support systems based on GIS and SDI.

INTRODUCTION

The need for computer support of decision-making in economics and business today is due to the influence of a number of objective reasons, such as: increase in body of information coming to management and executives directly; complexity of problems solved every day and for the prospect; the need to account and consider a large

number of rapidly changing interrelated factors and requirements; increasing importance of the consequences of the decisions made, and so on. All these caused rapid development and wide use of Decision Support Systems (DSS).

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DSS are widely used in world, and their number is constantly growing. A number of DSS are used at the level of strategic management and in Oriented operational management DSS.

For the improvement of the process of Decision Making, GIS and SDI capabilities are integrated to SDD.

SDIs aim to facilitate and coordinate the sharing of spatial data between stakeholders, based on a dynamic and multi hierarchical concept that encompasses the policies, organisational mandates, data, technologies, standards, delivery mechanisms, and financial and human resources necessary to ensure that those working at the appropriate (global, regional, national, local) scale are not impeded in meeting their objectives. This in turn supports decision making at different scales for multiple purposes and increases benefits to society arising from the availability of spatial data.

For first-generation SDIs, data was the focus, and initial development was driven by top-down national governments. The second generation is driven by the needs of users, with the focus on the use of data and data applications as opposed to the data itself, with one result being that sub national governments and the private sector have greater influence.

GDSS differs from SDI in that it relies on variable data from local contexts with all its idiosyncrasies relevant to decision making. Also data are not necessarily shared, but judgments and meta-data are, as well as partial analytical products. And finally, contrary to SDI, GSDS have to consider both spatial and non-spatial data since rarely spatial decision problems are only about spatial considerations.

BACKGROUND

SDIs were initially conceived as a mechanism to facilitate access and sharing of spatial data for use within a GIS environment. Their role has changed in order to support more effective cross-jurisdictional and interagency decision making in priority areas (International Development Research Centre, 2000, Keenan, P., B., Jankowski, P., 2019).

Decision Support Systems

In spatial planning, territorial planning is of fundamental importance. It allows the development of a coherent intervention framework to implement a common