APPLICATION OF GIS IN NTEGRATED RIVER BASIN MANAGEMENT, CASE STUDY OF THE BLINAJA RIVER BASIN, KOSOVO

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ABSTRACT

Water is one of the most underlying resources in our life, for human life and for a sustainable development. Integrated managing of water resources asks for a wide base of date concerned with water. The neccesary information to evaluate the water resources is comprised of all variables that close the balance of water that is collected in the reservoir. The managing of a river basin (WFD 2000/60 EC) is admitted as a mechanism that responds to the requirements of the community as far as the river pond is concerned. In many cases the existing crises of water resources comprises in itself a crises which is concerned with managing process of water resources as well as lack of proper information which is related to exploitation of water. The management of water resources in real time as well as the implementation of GIS technology the most demanding challenges that the respective authorities which are obliged to cope with. This paper aims to reveal and demonstrate how GIS facilitates the process of planning and managing the water resources in the river basin of Blinaja. GIS serves as a tool which provides opportunities for carrying out the systemization, analysis and managing of collected data which are related to planning the water resources in the respective basin. The results of this paper witnessed how the implementation of GIS technology has succeed to provide rapid assessments, visualizing oppotunities aiming to assist the planning, exploitation and well-administering until the decision-making process in the river basin of Blinaja.

Key words: *Water, River basin, Management, GIS, Data, Information.*

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INTRODUCTION

Water is vital for human survival, health and dignity. It is also a fundamental resource for human development. Nowadays the quantity of potabel water on earth is limited and its availability per capita is reducing day by day due to increase in global population and ruining of environment (Gowda & Doddaswamy, 2011). The integrated management of water resources requires a broadly data base and information directly to water. The necessary information to evaluate water resources consist in all kinds of variables that are required to close up the water balance amidst different degrees. According to WFD, the river basin is considered as the main unit for integrated water management. The first step of Integrated Water Resources Management is to scan the overall area under consideration, to identify sub-areas with water quality problems, and rank these sub-areas according to the level of problem intensity in order to decide where to start with water management measures. To carry out this initial step in the case study Blinajë river basin, there was elaborated a methodological concept which was based on the application of GIS technology. GIS is a very powerful tool for the development of the watershed area with all natural and socio-economic facets for better planning, execution and monitoring of the project. Advanced technologies and approaches, such as geographical information systems (GIS), offer a unique opportunity to tackle spatial problems traditionally associated with more efficient and effective data collection, analysis, and taking into consideration all the possible alternatives

STUDY AREA

The study area is located in the central part of Republic of Kosovo (fig.1.), between the geographical coordinates 20º 57′30″, 21º 04′00″ and 42º 28′20″, 42º 33′50″. The chachment area is 31.19 km^2 (Çadraku H., et.al. 2016), they are devided into two morphological units. The climate of the river basin Blinaja is continental (Pllana R., 2015), the average annual rainfall are 660 mm (2001-2011), the largest amount of rainfall 66.7 mm in November, while the lowest in February 31.1 mm (KHI quoted by Bublaku S. 2015). Air temperature referring to the meteorological station of Prishtina, in 2013 the average annual temperatures ranged from 0ºC (December) up to 23.4ºC (August).

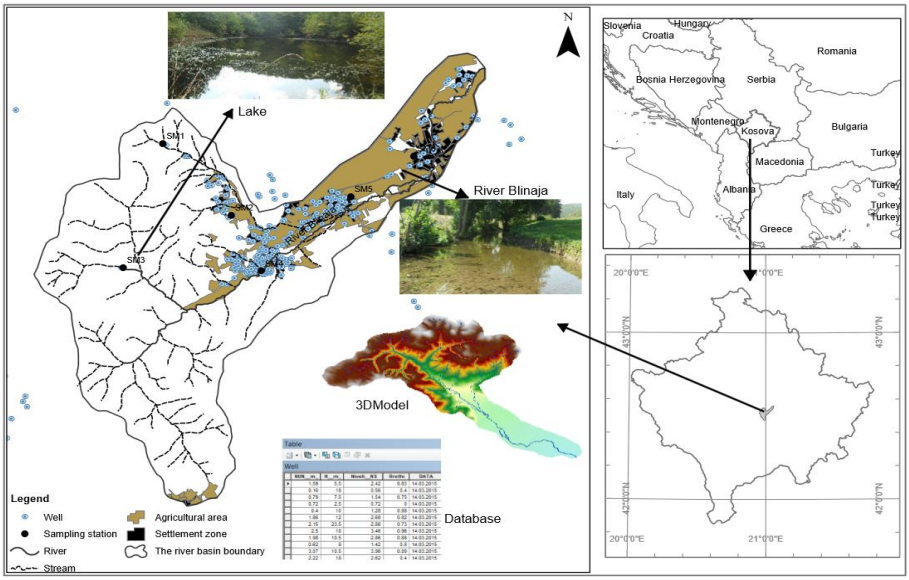

Fig. 1. The position of the river basin Blinaja

METHODOLOGY

There has been applied and implemented a working methodology, which represents in itself a systematic labor which is mainly relies on research and that are carried out in pratice. The scope of research which has been implemented in this paper is closely related to the subject called gathering of scientific data. (Jakupi A., 2005). GIS database was created using different cartographic documents at the scales 1:25 000, 1:50 000, 1:200 000. most of the thematic layers have been taken from this classical mapping support. The physical structure of the system is shown in fig.2. The maps were scanned and converted in digital formats, whereas the images which were imbibed from the air were geo-referencing. Due to fact there have been created and designed digital maps concerned with hydrographic network, water resources, wells, sub-basin, inhabited areas, road network, agricultural land and land coverage.

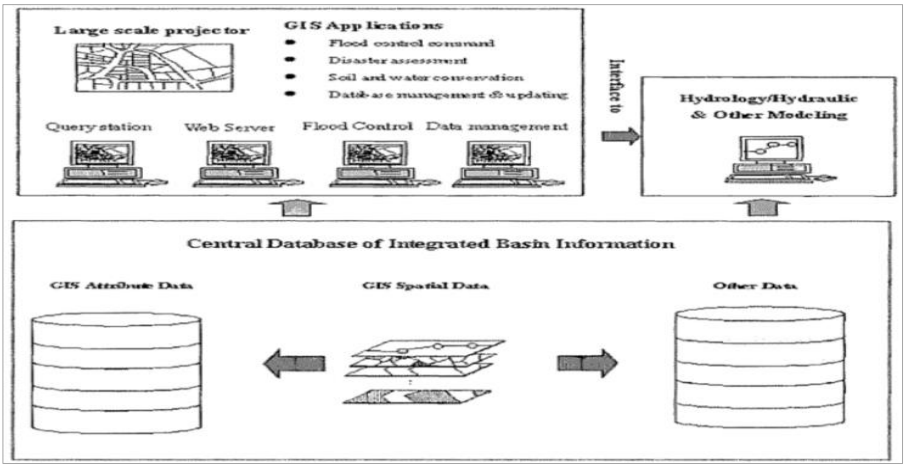

Fig.2. Sistem structure (according to: Wu Chaojun., et.al., 2004)

RESULTS AND DISCUSSION

The determined of underlying objectives concerning the river basin management in other words emphasizes the importance between the coexistence between human and water. The implementation of GIS resulted in a multifaceted conclusion that determined the repective coverage of each area. Consequently, the catchment are is covered by: 64.86% forests, 17.37% agriculture land, 9.21, mountain pastures 5.02% inhabited area, 2.32% meadows, 0.86% road infrastructure and 0.14 water area. To conclude GIS facilitates the process which is related with the delination of water bodies and the codification system. In this case study there was also managed to create a broad data base for parameters which are neccesary for integrated managing of water resources. There was also enabled to create a 3D model for the Blinaja river basin. These data which have been imbibed by GIS in this case study may be up-to-dated and are of significant importance for planning, administering and decision-making.

CONCLUSIONS

Many real-world spatially related problems, including river-basin planning and management, give rise to geographical information system based on decision making bodies. Owing to fact that the incorporation of spatial policy alternatives is traditional and it is often represented by thematic maps, digital maps and their underlying data base are well suited for water resources

planning. Therefore it is possible to geo-reference them indirectly. In this way we reach the unification of the format of the information as well as georeferencing the visualization of data. The date which have been depicted from GIS in our case study, might have a crucial importance and strong impact on service delivery and local policy implementation.

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