Assessment and analysis of physical development and land use changes on Parsabad moghan city by using of Remote sensing data

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EXTENDED ABSTRACT

Introduction

Development and Expansion of the city in vertical and horizontal directions is one of the important issues for urban planners and planners in all cities of the world. The expansion of the city is caused to change in the urban land use; surely, the more the expansion and development of the city is more, the more the changes made to the land. Since the use of traditional methods for determining urban development and land use changes has time consuming and costly. Therefore urban development and land use changes can be reviewed using multi-dimensional satellite imagery, multi maps and remote sensing measurement. Using these measurements can be showed the urban development and the urban land use changes in different periods and compared with each other and can be obtained the amount of those changes over the previous period. The Parsabad city was established in the event of development plan and civilization of Moghan Plain in order to exploit the fertile land of the plain as a novel city in 1953. The whole development stages of the city are carried out in four stages which the first; second, third and fourth stages occurred before 1957, 1957-1986, 1986-1996, after 1996, respectively. Due to the rapid urban development in agricultural lands is led to change land use around the city in the past years. Therefore, the overall objective of this research is to assess and analyze the physical development and land use changes in Parsabad city and the surrounding lands of the city using satellite imagery for 26 years. The research hypothesis is as follows: It seems that the area of agricultural and land cover areas around the city decreased with the development of Parsabad city, and the area of Parsabad city has been tripled during 26-year period. Modeling of the land use change and urban development facilitated using the development of the GIS and RS measurement in providing appropriate spatial information in the 1990s and their use in spatial modeling of land use changes. The Satellite Remote sensing has provided multi-spectral and multi-time data that is both cost effective and provides valuable information for understanding and monitoring of patterns and land development processes. They also provided a set of covert data and land use data. These data could be used to determine the type, amount and practice of land use change.

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Methodology

The method of this research is descriptive-analytical. Data gathering method is documentary and field method; the tools used for analysis in this study are also Envi 5, Idrisi Selva, Arc Gis10.1 software. In this research, RS data and Landsat satellite imagery, TM sensor in 1989, Landsat ETM + sensor in 2002, Landsat 8 in 2015 have been used in order to analyze the urban development and land use changes during different periods. The Crosstab function is used in the Idrisi Selva software environment to analyze the land use changes. In this study, supervised classification method is used to classification. Five users determined which including built levels (cities, villages, roads, industrial areas, etc.), water body (rivers, canals, marsh and swamps), farms, forests lands and gardens using the ROI tool in ENVI software.

Results and Discussion

According to the effects of physical development of Parsabad city on the lands around the city, it indicated that land use changed during the 26-year period. What is clear during this 26-year period is that the baren land use has the largest change with 867.45 hectares. Most of these changes in terms of area and percentage are related to farms and built area with 448.08 ha (6.99%) and 359.55 ha (6.99%) during this period, respectively. The second land use is built area with a high variability with 683.48 hectares. The third land use is the farms land use , which has changed 309.09 ha which most of these changes 344.52 ha (5.40 %) is related to build area and bare land use with 112.18 hectares (1.76%). The results showed that the Parsabad city area has been roughly tripled during 1989-2015. The area of the city was in 1989 and 2002, was 2677.6 ha and 567.20 ha, respectively, and it reached to 820.48 ha in 2015. It can be concluded that by examining the land use maps in the last 26 years: increasing the city's area has been accompanied by changes in other uses during different periods. As a result, over the past 26 years, the urban areas has been increased, and the agricultural lands and bare land area in particular bare land area has been decreased. As well as, the city development has caused environmental problems, rural placement along with urban texture has caused which land use changed and degraded.

Conclusion

Accidental urban growth is lead to urban development and land use changes. Land use changes in urban areas are usually related to economic development reflection and population growth. Parsabad City has also developed a lot of physical development in recent years as a new (novel) city. This development has changed the land use of the city and the surrounding areas of the city. The method of this research is descriptive-analytical. Data gathering method is documentary and field method; the tools used for analysis in this study are also Envi 5, Idrisi Selva, Arc Gis10.1 software. In this research, RS data and Landsat satellite imagery, TM sensor in 1989, Landsat ETM + sensor in 2002, Landsat 8 in 2015 have been used in order to analyze the urban development and land use changes during different periods. The Crosstab function is used in the Idrisi Selva software environment to analyze the land use changes. The results of the study indicated that the area of the build urban land increased from 278 hectares in 1989 to 560 hectares in 2002 and it increased 820 hectares in 2015 which these results of urban development is lead to at the expense of other land uses, in particular bare land and farm land use, so that Land use area of bare land has decreased from 1059 ha in 1989 to 192 ha in 2015.

Keywords: Keywords, Remote sensing data, Changes analysis, Crosstab Function, Parsabad city