Research Paper

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Developing Slum Information System of Kalaburagi City Using Geoinformatics For Unified And Comprehensive City Development

Geography

KEYWORDS : Slum, Remote sensing, GIS, GPS, Information System.

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ABSTRACT

Slum refers to the marked area by poverty and inferior living area. These are illegal urban settlements on public land, usually grow over a period of time which surrounds the city from all the sides and are more prevalent in the metros, but these are slowly becoming part in other cities and towns of India. Now a days due to emergence of the spatial technology it is possible to get updated information from the various parts of the world and these are more useful to the places where census data or other data are not readily available. A good base for decision or slum planner may assist them in accurate mapping, identifying the poor people in the settlement through the linkage of their socio-economic information to their spatial location and the resultant information after incorporating spatial information with the attribute information will be very much beneficial to the common people. Geoinformatics helps as a decision support system for proper planning and governance of urban areas with respect to resource allocation and generation, social environmental & infrastructural facilities. It is a platform which integrates multiple databases of information to provide spatial representation. This paper considers the use of Geoinformatics to provide a way to represent and analyse of the problem or provide a way out to diverse techniques. The slums map will give an indication to the academics, researchers and administrators for further planning activities.

Introduction

A slum is defined as a heavily populated urban informal settlement characterized by substandard housing and squalor. Describing slums educates numerous conceptual concerns, making it challenging to exactly estimate the slum population existing in urban areas. Theories and explanations of slums differ from country to country and even in the similar country, slum settlements might be known by altered names In order to carry out the urban planning and development tasks essential to improve living surroundings for the poorest world-wide an satisfactory spatial data base is required and this can only be acquired through the exploration of remote sensing data. Meanwhile traditional devices demand more labour, money and time, substitute methods that consist of sophisticated techniques to extract the data from remote sensing data of very high resolution (VHR) and therefore might decrease bias, time and labour and afford more consistent information requirement of the period (Shekhar, 2012).

The word "Slum" faces encounters in its description. It is altered in each province or country in its appearances. 'Slum' is a term which has dissimilar groups of familiarities. These groups are fading inner-city dwellings, resident settlements, informal settlements and shantytowns. The UN- Habitat report defines the slums as "a severely inhabited urban area considered by insufficient accommodation and squalor" .The description shows the main features of slums. Physical and spatial characteristics are accessible in high compactness, low standard of housing (Shehata, 2013).

Geoinformatics is a branch of Geo science which deals with the information technology to improve the organization and access of geoinformation to geographers, geologists and engineers. By applying collected data and developing complex models based upon these data, geoinformatics can be used to advance both geoinformatics and engineering to deal with many of the problems of these sciences. Work familiarises the geoinformatics as a technological tool to capture, manage and help the all forms of geographic reference data analysis to facilitate informed decision making. It integrates the geographical data as per specific project requirements and also acts as a supportive tool for planning assessment, which is currently used as decision support tool in urban development.

Study Area

Kalaburagi district is located in the northern part of Karnataka State. In the earlier days, Kalaburagi was a district of Hyderabad Karnataka area and became a part of Karnataka State after reorganization of states. Kalaburagi city is located in the state of Karnataka. It is the administrative headquarters of Kalaburagi District and of Kalaburagi Division. It was formerly part of Nizam's Hyderabad state. Kalaburagi is lies between 76°.04' and 77°.42' east longitude, and 16°.12' and 17°.46' north latitude, covering an area of 64 square kilometres. The pallets in figure 1 visualises the location of study area.

In Kalaburagi there are 61 slums. 52 notified and 9 non-notified. The total population living in the slums is 60196 (year 2011) and accounting to 11 per cent of the city population. The total number of slum households is 12085 accounting to nearly 16 per cent of the total households in the city (As per Karnataka Slum Board Office, Kalaburagi Branch).

(Figure 1: Location of Study Area)

Data and Methodology

Data and Materials Used:

Slum Census Data (2011) collected from Karnataka Slum development Board, Kalaburagi *(as the non-spatial or ancillary data).*

Geo-eye Image of Kalaburagi city(*for slum areas identification/ extraction).*

Google Earth 7.0 (*for cross-checking the digitized areas).*

Garmin Trex GPS Instrument (*for insitu data collection*).

Methodology

(Figure 2: Illustration for Working Methodology)

Above figure 2 depicts the working methodology to complete the whole task. Several input layers were collected for the preliminary work and for the purpose of bringing all the layers to the common platform and geo-referenced together for bringing to common reference plane. After that slums were digitised based on the textural characteristics of the objects perceived through the very high resolution images. Beyond these, all the layers were overlayed together to observe the consistency and spatial pattern of the data. The relevant data were derived to separate layers and non-spatial data were augmented to their attributes for the creation of the slum database. Similar steps were repeated for the different slum area to build the consistent slum database.

Results and Analysis

Spatial Database created of all Slum Areas of Gulbarga City

(Figure 3: Spatial Database created of all Slum Areas of Gulbarga City)

Figure 3 visualises the slum spatial database being created for the Kalaburagi city. The right hand side appended table in same images shows the attribute table for the same and the red dotted circles marks the locations of slum areas in the city.

Slum Information

Figure 4 depicts the information displayed by the slum database of Gulbarga city. The left part of images shows the zoomed view of the slum areas with locations along with information being displayed on the right hand side of the image panel. The amount of the information being displayed will vary from the project as well the requirement of the user. The information is also dependent on the attribute table attached to it, so the accuracy of the displayed information is the part and parcel of the attribute table being augmented to any slum locations

(Figure 4 Slum Information)

Slum Rehabilitation Information

(Figure 5: Slum Rehabilitation Information)

As discussed in earlier the figure 5 displays the information about slum rehabilitation in the city.

Conclusions:

We know that defining slum raises several conceptual issues and makes difficult to precisely estimate the slum areas along with the living population in those areas. In order to carry out the urban planning and development tasks necessary to demarcate and locate the poorest people staying world-wide, an adequate spatial data basis is needed which requires the analysis of remote sensing data to provide more reliable data within the hour. The current endorses geoinformatics as a technological tool to capture, manage and help the all forms of geographic reference data analysis to facilitate informed decision making. It also integrates the geographical data as per specific project requirements and also acts as a supportive tool for planning assessment, which is currently used as decision support tool in urban development. The major outcomes of the current work can be narrated as:

Evaluates the applications according to their usability, interactivity and visualisation through GIS in slum area of Kalaburagi city.

Results of the study shows some directions for on-going and future work including suggestions for GIS evaluation by non-expert users.

Observed that GIS mapping methods contributes – positively, by improving dialogue, redistributing resource access and control rights – though not always equitably – legitimizing and using local knowledge, exposing local stakeholders to Geospatial analysis.

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Figure 1: Location of Study Area

Figure 2: Illustration for Working Methodology

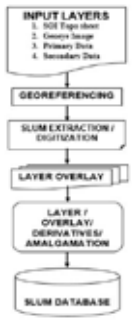

Figure 3: Spatial Database created of all Slum Areas of Gulbarga City

Figure 4: Slum Information

Figure 5: Slum Rehabilitation Information

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