

# GIS IS A TOOL FOR MICRO LEVEL PLANNING FOR SQUATTER SETTLEMENTS

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**Abstract – slums and squatter settlements are the physical manifestation of urban poverty, the root cause of the origin and growth being urban-rural migration, economic inequality and over all development of the country. Over crowding, no housing or dilapidated/sub standard houses, lack of proper light and drainage etc, are the common problems in slum areas.**

**The urban community development (UCD) cell was established in 1967 in the Hyderabad and has been implementing urban poverty alleviating programs. The Draft National Housing Policy in 1998, adopted by the government for the betterment of living condition instead of “slum clearance” approach to that of “slum improvement”.**

**In this scenario, two clear-cut approaches emerge for tackling the physical and social problems of the slums and squatter settlements. So the main aim is to improve the environmental conditions of the poor, promoting health, safety and better living with the help of Geographical Information Systems as a tool.**

**Key words:** squatter settlements, slum improvement, physical infrastructure and GIS

## 1. INTRODUCTION

Slums are an integral part of urban areas and contribute significantly to their economy both through their labour market contributions and informal production activities.

The poor represent an extremely important element of the urban labour force and contribute substantially to total productivity and labour market competitiveness. It is vital that all Urban Local Bodies (ULBs) recognize the contribution of the urban poor in helping to build urban prosperity and make sufficient provision for them to have access to affordable land, house sites and services. The present planning and development framework is exclusive of slums and informal settlements. It views slums as “problem areas” requiring corrective action.

A compact area of at least 250 population or about 60-70 households of poorly built congested tenements, in unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities. This definition appears to be satisfactory at all India level. In general, all under-serviced settlements, be they unauthorized occupation of land, congested inner-city built up areas, fringe area unauthorized developments, villages within urban areas and in the periphery, irrespective of tenure or

ownership or land use shall be covered under the definition of a slum/informal settlement.

### 1.1 Problems

The urban centres, particularly the metropolitan centers of India have become enclaves of economic power, thanks to the dualistic process of development, which attracts and depends upon the migrated rural labor for its own day-to-day economic survival. Thus the urban units, in economic terms, contribute a significant quantity of labour force to the urban labour market and generate adequate income not only to sustain the urban economy but also to attract more and more migrants towards these urban economic enclaves. It is not only the rural-urban income differentials, as perceived by physical and demographic planners that activate the ‘push’ and ‘pull’ factors, but other factors such as access to basic facilities and amenities, access to institutional and political power, etc., also trigger off the rural-urban as well as the urban-urban migration.

In most cities of the developing world, up to one half of urban population lives in informal slums or squatter settlements, which are neither legally recognized nor serviced by city authorities. The informal sector in the urban area, however, occupies an important position in a city’s economy.

### 1.2 Reasons for growth of slums

The reasons and causes of unauthorized growth and constructions of slums can be grouped into two categories as below:

#### Demand factors

- 1) Rapid population growth rates due to natural increase in population and rural-urban migration.
- 2) Persistent urban poverty and unemployment-unequal distribution of income.
- 3) Lack of access to credit facilities.
- 4) Price level of housing unit and other commodities.

#### Supply factors

- 1) Shortage of appropriate urban land due to:  
(a) zoning practices which favour private holding of land by the rich minority; (b) speculation which results in the private holding of land; (c) bureaucratic delays and procedures in acquisition proceedings.
- 2) Government imposed minimum building standards, which have the effect of retarding the rate of construction of private dwellings.
- 3) Lack of Government involvement reflected in low investment in housing and indifference to the needs of low-income urban groups.
- 4) Ceiling on urban property and taxation.



Infrastructure projects are spatial activities and slum settlements are spatial entities. Hence spatial information is essential. "GIS is a tool which allows us to use and analyze spatial information in conjunction with relevant socio-economic information, and is therefore an ideal basis for planning". In addition, this information is intended to create an impact that is best achieved with a visually clear and attractive format, which again the GIS achieve effectively.

Explaining the exact process, "GIS integrates spatial information (maps) with any other data you have collected. For example, a typical slum map will show you the physical features of the area, but it does not say anything about the inhabitants and their demographics. So what we do is sending out workers to collect the relevant socio-economic information about the residents and then superimpose all this on the plane-table map that we have scanned".

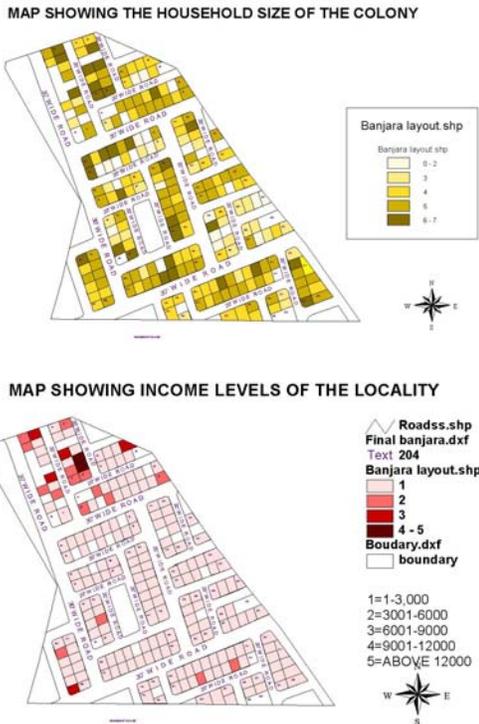


FIGURE 2 & 3: The above map explains about the income levels of the slum, which clearly shows that the higher income families are together to form a group.

This analysis of socio-economic data helps in proposal for the space for dwelling unit, religious facilities, education facilities and road width, parking facilities and type of housing required for rehabilitation.

This housing data helps in analyzing type and the tenure status of the housing, rent values of the locality. And also the type of structures, floors and the built-up

area of the dwelling units. It also gives the data regarding the no of units having toilet facilities and age of the structure and structural quality. Using GIS the Land use of the slum can be identified.

**MAP SHOWING THE TYPOLOGY OF THE HOUSING**

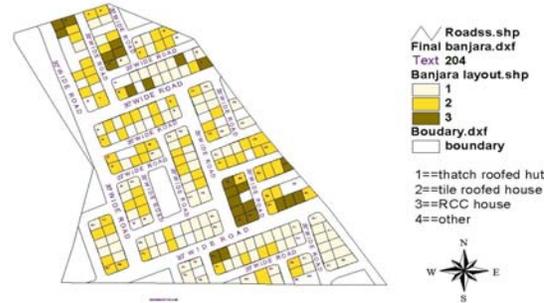


FIGURE 4: The above map shows that typology of housing in the slum, it shows that most of the houses are thatched roof and tile roof.

What's more, the GIS allow you to run queries and make analyses and this is its biggest advantage. Hence, what you have is not just information, but "intelligent information".

And also we can create buffer zones, so that how much distance covers the one public tap, by that it will be known that how many people are using that public tap.



FIGURE 5: Circles are drawn at a distance of 100 feet around each common water stand post. This demonstrates that water to household reach is not good.

**2.1 Methodology proposed by MCH**

**Phase 1:**

- The NRSA (National Remote Sensing Agency) base map has been procured
- Capturing the boundaries of the slums, through GPS survey, and attributing the slum profiles
- Capturing the data of amenities like street lights, water supply points (Public), roads,

sewerage system (underground drains, open drains and manholes)

- Piling of all the families data to their respective blocks

#### Phase 2:

- Capturing the building footprints via spatial survey (approximation)
- Attributing, families previously piled in the blocks to their respective building footprints.

### 3. THE HYDERABAD EXPERIENCE

Hyderabad, the capital of Andhra Pradesh, is the sixth largest city in India, with a population of 3.7 millions in 2001. It is situated at 17°25' N longitude and 75°25' longitude and lies on the banks of Musi River. The municipal limits of Hyderabad and Secunderabad city cover an area of 192 Sq.Kms.



The slums covered 5 percent of the city area and contained 17 percent of the urban population, which was about 1.9 lakhs in 1957. In 1964 there were 94 slums and a study by the council for Social Development in 1976 reported 273 slums with a population of over 300,000. By 1979 there were 455 slums, spread over an area of 900 acres in the twin cities, covering a population of half a million. At present there are 792 identified slums existing with a population of 12.58 Lakhs.

The Hyderabad Slum Improvement Programme (HSIP), run by the Urban Community Development Department (UCDD), a special wing of the Municipal Corporation of Hyderabad, covers some of these. The programme has adopted a comprehensive community development approach, and its major thrust lies in providing physical infrastructures like housing, roads, electricity, drainage, drinking water, community latrines, storm water drains etc.

The UCD has been operating in these slum areas from 1967. Their approach is different from the traditional

approach to slum development. The programmes are conceived on the basis of felt needs, and executed with the participation of the community who are benefiting from them.

### 4. CONCLUSIONS

- Slums and squatter settlements are the physical manifestation of urban poverty.
- The present planning and development exclusive of slums and informal settlements.
- It has been observed that the view –“slums as the problem areas” need to be changed to slums as important components.
- Socio-economic information of the settlements should be collected and analyzed for identifying the slums (Household survey).
- GIS can be used as an effective tool for slum improvement.
- The quality of attaching attribute information to the spatial information is the crux of the GIS system in analyzing and isolating the target settlements to be improved.

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### 6. ACKNOWLEDGEMENTS

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