



Dec.-09—Jan.-2010

## IDENTIFICATION OF SLUM ENVIRONMENT USING SATELLITE DATA: A CASE STUDY OF LATUR CITY (M.S.)



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### ABSTRACT

*In this study, an attempt has been made to identify of slums using the (1m and 4m) satellite images and assessment of slum environment in GIS supported by ground verification. The slums were identified on the basis of visual interpretation and were captured manually using on-screen digitization method. Finally database was created and labeled with the help of necessary ground checks. The visual interpretation of the study area showed clearly the location and areal distribution of the slums. For this purpose, interpretation parameters like, pattern (layout), shape (roof types etc), size (small, medium, big), and tone and association were used. Then the slum areas were identified and labeled after detailed ground check. Detailed mapping of a particular slum area was carried out and data-base was prepared with the help of a structured questionnaire (household and physical infrastructure). The parameters taken for the case study were individual condition of houses like: roof material, wall material, access to houses, drainage (water logged or not), water supply (per capita, stand pipes, duration of supply, and storage of water), electricity, sewerage/ sanitation and street lighting.*

#### Introduction :

In the developing countries like India, the acute problem of slum formation is found not only in the big cities but also in medium and small cities and towns. Due to rapid urbanization and consequent haphazard growth, most of these cities have become congested and unhygienic. It is clear that rapid processes of accretion as a result of incessant flows of immigrants caused the present changes in aerial size of slum. In most of the municipal bodies proper up-to-date maps of slums along with proper database and genesis of its growth are not available which create problem in developmental process. Thus, it is important to analyze the slum formation, slum morphology and impact on

surroundings to improve quality of life of slum dwellers. Under these circumstances, remote sensing plays a leading role by virtue of its repetitive and synoptic coverage that may become a base map for many government and semi government organization in a very rapidly growing urban area.

#### Objectives & Methodology :

The aim of the study was to locate slums and identify the physical characteristics of the slum areas that could be interpreted through high-resolution Ikonos satellite imagery. To present a comprehensive picture of the slums, two aspects, i.e. spatial distribution and growth, and physical infrastructural services related to slums has been taken into account. High-

resolution satellite imagery (Ikonos satellite Data acquired April 2000) was used to detect, identify and delineate the slums in Latur to detect the changes that has taken place in terms of new slum development and to map condition of slum environment. GIS was used to identify the slum areas that had fallen under flood vulnerability.

**Analysis :**

**Slums in Latur City as a Whole**

The slums are in the form of hutments, where there is no proper light, ventilation and other sanitary condition etc. it is generally observed that the land owner converts the plots irregular shape and of substandard area and sale them out to the needy person without having proper planning for their land. This has resulted in unplanned development having a public amenities, no proper roads and sanitation for healthy development of the town. To checkup and improvements of such development a timely control is very necessary. Municipal council, Latur has provided a list and map of notified slums. There are 24 notified slums declared in Maharashtra Govt. Gazette dt. 15/12/83, which includes an area about 215.92 ha. area in Latur city. The slum expansion is due to the pressure of the population mostly on un-used, un-protected and un-suitable government land. In highly developed areas, the slum pockets do not expand as the land is not available for expansion and is better protected due to the higher

cost. It is observed that though the extent of slums area is more in residential pockets, but there is a tremendous growth in the existing slum located along the linear features like drainage channels, roads, and railways and as a result mostly are linear in nature. The slums in inner city area are less in extent and are in stagnant situation than the slums in peripheries (as no provision for further growth is there).

In Latur, the slums, in inner city area did not register any increase in number between 1996-2000, whereas the slums in the peripheral area registered a high growth. The internal land use and utility were studied through satellite imagery and through field survey to find out the causes for sporadic and haphazard development of Slums. The present study area constitute 7 different slums, namely Ganjgolai, Ambedkar Nagar, Budda Nagar, Mahada, Prakash Nagar, Nanded Naka, Shideshwar Mandir road. Thus, the satellite imagery was found very useful in marking the layout pattern of slums, by-lanes, counting the buildings (structures), water logged areas etc. However the imagery does not show the activity within buildings, but show only the site adaptation. Detailed building uses e.g. the shops, small temples etc. could only be confirmed only during field survey.

**Conclusions :**

Most of the slums have developed in the periphery along the natural drainage channels. Most of the slums may wash out and may cause immense loss to

**Table-1: Composition of Roof Material**

	Ganjgolai	Ambedkar Nagar	Budda Nagar	Mahada	Nanded Naka	Shideshwar Mandir	Prakash Nagar	Total
Asbestos	24	13	20	30	32	22	11	152
Concret, Tin	5	2	4	5	17	12	25	70
Concrete	78	70	105	195	114	148	75	785
Co. & Plastic	1	0	0	2	0	0	2	5
Co.&Tin	10	4	5	16	2	0	2	39
Plastic	4	0	0	1	0	2	0	7
Tin	5	0	8	13	1	7	3	37
Tin&Plastic	15	29	40	25	47	65	51	272
Wo.& Pl.	0	0	2	0	0	0	0	2

human life and property. Regarding the study area it has been observed that although most of the slums are marginal slums, but the condition is not so bad in terms of living. The large number of pakka houses, better sanitation condition, available electricity, access to house etc. gives us picture of a slum area having mixed socio-economic condition.

From the above study it may be concluded that

most of the slums in Latur were formed by encroaching the major drainage channel, and flash flood may damage most of the slums located in this area. So, proper care, planning and management should be taken to mitigate the flood risk vulnerability in slums. The urban planner therefore, has to take these facts into consideration and also monitor the vulnerable areas for checking the growth and expansion of the slums.

**Table-2: Composition of wall material**

	Ganjgolai	Ambedkar Nagar	Budda Nagar	Mahada	Nanded Naka	Shideshwar Mandir	Prakash Nagar	Total
Brick	117	68	119	294	179	149	139	1065
Brick and Stone	-	-	-	1	-	-	-	1
Mud	1	-	-	5	5	-	12	23
Mud and Plastic	-	-	-	-	3	-	-	3
Plastic	-	-	-	-	-	8	6	14
Tin	-	-	-	-	3	-	-	3
nburned-Brick	14	12	-	12	4	16	54	112
Wood	-	-	-	-	1	-	-	1

**Table-3: Physical Infrastructural Facilities**

	Water Supply Yes / No	Electric Supply Yes/No	Sanitation Yes / No	Drainage Yes / No	Street Lighting Yes/ No
Ganjgolai	83 / 49	96 / 36	84 / 48	40 / 92	62 / 70
Am.Nagar	34 / 46	49 / 31	31 / 49	32 / 48	36 / 44
Bu.Nagar	90 / 29	86 / 33	89 / 30	94 / 25	76 / 43
Mahada	229 / 83	242 / 70	228 / 84	205 / 107	203 / 109
Pra.Nagar	102 / 92	141 / 53	124 / 70	122 / 72	103 / 91
Na.Naka	87 / 86	130 / 43	116 / 57	105 / 68	62 / 111
Shi.Mandir	77 / 135	147 / 65	108 / 104	194 / 18	41 / 171
<b>TOTAL</b>	<b>702 / 520</b>	<b>891 / 33</b>	<b>780 / 442</b>	<b>792 / 430</b>	<b>583 / 639</b>

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