Since the beginning of the First Five Year Plan in 1952, the focus has been on encouraging rural development & planning. Decentralised and integrated district level and local level planning are being implemented to promote balanced development, especially in rural areas. The 73rd and 74th amendments to the Indian Constitution have bestowed greater responsibilities and powers to the local bodies, positioning them as the third tier of governance. This decentralisation of power has opened new opportunities for local level planning to effectively implement and monitor development programmes.

Geospatial technology is playing a key role in disseminating information at the local level for promoting and monitoring balanced development across rural areas. The technology is being used to improve planning, design and delivery of initiatives, particularly to address the needs of underprivileged groups and individuals. The policy framework provided by the IT Task Force of India, set up by the Prime Minister's Office, emphasises on the availability of spatial data to the user community. The policy framework has enabled the development of local level databases and spatial decision-support information systems network, with distributed network-centric Web-enabled GIS applications.

One of the initiatives for strengthening of local level planning at village, block, town and district panchayat levels is the ESD-GIS project, which aims to set up GIS infrastructure and applications in the state of Uttar Pradesh to facilitate collection and dissemination of information at the local level. A funding of ` 5 crore has been allotted for the project which is jointly initiated by Economics & Statistics Division (ESD) of Planning Department, Government of Uttar Pradesh and NIC-UP State Unit (NIC-UPSU).

The project has the following objectives:

- Creation of GIS infrastructure
- Creation/updation of digital base maps
- Development of thematic planning atlases
- Satellite imagery based

To address the issue of regional imbalance in terms of development and to promote inclusive growth, State Planning Atlas (SPA), District Planning Atlas (DPA) and Block Planning Atlas (BPA) are being developed.

application for integrated decentralised district planning
- Development of state GIS portal
- Development of multi-layered GIS system
- Human resource development

Creation of GIS infrastructure

The Planning Commission of India (PC) has launched a central sector scheme on Spatial Data Infrastructure (SDI) for developing multi-layer GIS to facilitate the work on national GIS. Particularly, the emphasis is on developing minimum multi-layer GIS at district level. Under this scheme, a National GIS Facility has been established at NIC-HQ, with a similar facility developed at PC and other nodes spread across the country. A state GIS server has been set up at NIC-UPSU data centre, Lucknow under this scheme.

Under ESD-GIS project, GIS cells have been set up at ESD-Headquarter as well as in the 70 district offices and are connected through NICNET/SWAN/other networks for exchange of geospatial information. A GIS server, 5 clients, a colour laser

Strengthening local level planning in Uttar Pradesh

Decentralisation of planning and decision-making authority to the local level is critical for achieving equitable development across states. A similar initiative in Uttar Pradesh has empowered the local authorities to promote balanced growth

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printer, a A0 colour scanner and Plotter, a 5-KVA UPS, Windows server Std 2003, ArcInfo 9.x, Arcview 9.x, Arc GIS Publisher and Image Web Server have been procured for the ESD-Headquarter. Two PCs, a colour laser printer, two 700 VA UPS, Arcview 9.x are installed to form a network at each district office. More than 350 officers/ officials of ESD and NIC have been trained on GIS tools and applications.

Creation/updation of digital base maps and data

The digitised boundaries of state, districts, blocks and villages already available with NIC and are being used to create micro level maps. Gram panchayat boundaries have been created from village boundaries available from NIC-Headquarter/ RSAC-UP. Besides administrative boundaries, locations of state capital, district headquarters and sub-district headquarters, major towns, villages/habitations, transportation and land-use/ land cover databases, water bodies, forest, soil, wasteland, drainage, watershed, geology & geomorphology layers and satellite imageries of varying resolutions like AWiFS (56 m), LISS (23.5 m), PAN (5.80 m) etc. are also available with NIC. Procurement of high-resolution satellite imagery of Mau district is still under process.

Local Level Data (LLD) of all the 97,942 inhabited villages is collected in a Village Proforma (VP) and updated annually which are maintained in all the 821 blocks of the state. Gram, Block, District and Divisional Sankhyikiya Patrika (SP) having information on more than 3,500 parameters of village, village panchayat, block, district and divisional levels is updated and published annually since the year 1976. It covers major sectors like agriculture and allied activities, industry, social sector, power, transport and communication, banking, urban facilities, rural infrastructural facilities etc. There are 15 sections in village proforma covering information on introductory details of village, population census, livestock census, agricultural census, educational facilities, medical & health facilities,

drinking water facilities, transport, communication & miscellaneous establishment facilities, loan facilities, and total irrigated area under main crops. Computerisation of Sankhyikiya Patrika was started in the year 1993. A Web enabled SPIDER (Sankhyikiya Patrika: Internet based Data Entry & Retrieval) system, using ASP as front end and SQL server at the backend, has been implemented for data feeding/updation directly from the districts on a centralised server located at the data centre in Lucknow in a decentralized manner on 24 X 7 basis.

Thematic planning atlases

In an attempt to address the issue of regional imbalance in terms of development and to promote inclusive growth, State Planning Atlas (SPA), District Planning Atlas (DPA) and Block Planning Atlas (BPA) are being developed and they will be used for resolving disparities in development at village panchayat, block, district and state levels. State and district level static thematic planning atlases have also been prepared for Uttar Pradesh.

State planning atlas

The planning department under the government of UP in collaboration with NIC-UPSU has prepared a bilingual state planning atlas using GIS tools. The atlas for the years 2003-08 have been published in the book form as well as on the Web.

The atlas has been prepared in three parts: Part-I – Maps and charts showing inter-state position of important indicators, Part-II – Indicator-wise ranking of the regions according to the level of development and Part-III – Maps and charts showing
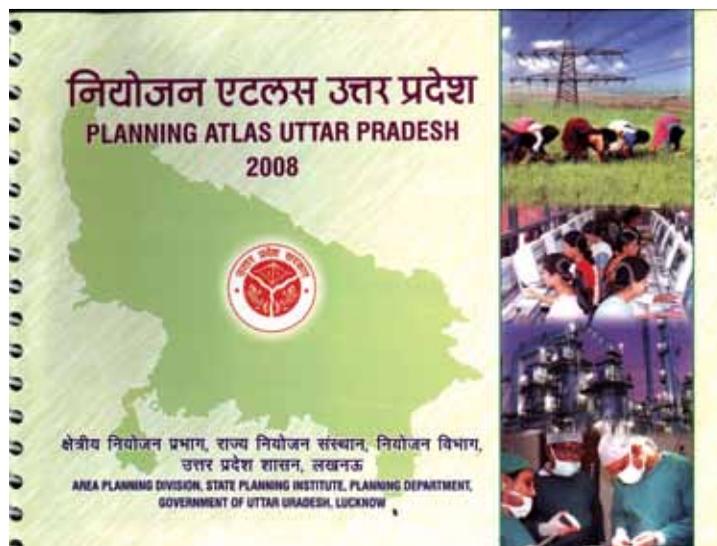
Figure 1: *Planning Atlas Uttar Pradesh, 2008*

Figure 2: *Classification of districts according to composite index of development (based on 36 important indicators)*

Figure 3: *District Planning Atlas of Lucknow*

the classification of the districts on the basis of indicators of development.

In the atlas more than 100 thematic maps have been presented showing inter-state and inter-district positions of the important development indicators. Districts have been classified as backward and forward on a composite index based on 36 indicators as given in Figure 2.

District planning atlas

On a pilot basis, Lucknow district planning atlas was prepared using ArcView in the year 2006, both in the book form and digital form available on the Web. It has been presented in two parts: Part I – Maps and charts based on 30 indicators, showing comparative position of the districts within the administrative division and Part II – Maps and charts based on 69 indicators

Dynamic thematic planning maps will provide a clear picture of any facility, as it would help the planners to gauge the effects of any plan and to effectively monitor the utilisation of funds.

showing the development position of the blocks in the district. The atlases are regularly being updated in all the districts of UP.

Dynamic thematic planning atlases

A Portal e-MANCHITRA (Map based Analytical Charting and Reporting Application) has been developed for generating dynamic atlases and disseminating various other GIS products. This portal will have linkage with national GIS portal as well as other GIS websites/portals. For measuring the local level (village panchayat, block and district) sustainable developments, a very large number of maps based on Sankhyikiya Patrika databases are required to be dynamically and interactively generated for decision making. Dynamic SPA, DPA and BPA have been developed using Arc GIS Server with .Net application development framework and integrated with e-MANCHITRA portal. Integrated spatial and non-spatial data are stored in SQL server through ARC SDE (Spatial Data Engine) in the multi-user geo-database form. Indicators used in different types of dynamic atlases are generated automatically through a software module from SPIDER portal. Sample thematic maps of DPA and BPA are given Figure 4 and 5 respectively.

Mapping of infrastructural facilities

Databases containing information on the availability of basic infrastructural facilities for each village of Uttar Pradesh is available since 1995 and is being updated annually through the SPIDER portal. A GIS base system has been developed for
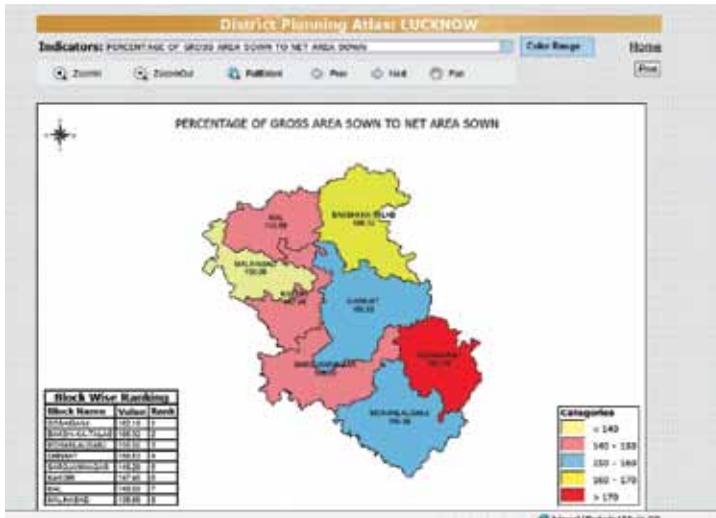
Figure 4: *Classification of blocks in Lucknow district according to the percentage of gross area sown to net area sown*
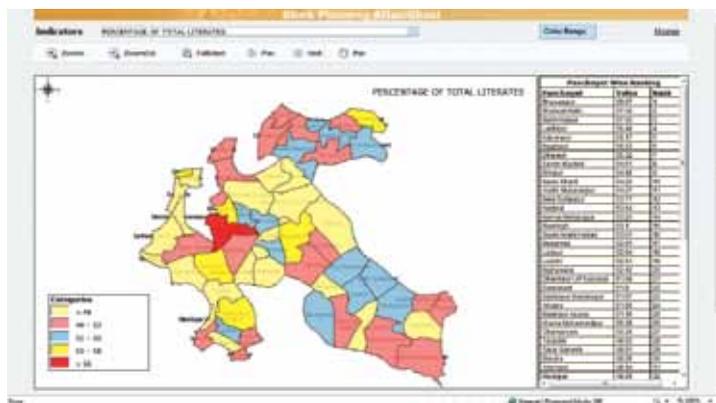
Figure 5: *Classification of Gram Panchayats in Ghosi block of Mau district according to the percentage of total literates*

mapping of infrastructure, which is very helpful in identifying the gaps in availability of basic amenities and to identify the locations where facilities are necessary to be provided.

Web-based multi-layered GIS system

This application facilitates instant displaying of multiple data sets. Various thematic layers like rail track, road, canal, forest, structural lineament, drainage line, drainage polygon, land category, ground water, lithological, land-use/land cover, watershed, geomorphological, soil, settlement area etc. can be overlaid and analysed.

Conclusion

Successful implementation and integration of spatial and non-spatial data into a GIS framework with proper local level planning is critical for attaining sustainable development. Planners, managers and administrators should be facilitated with maximum information that they can utilise with proper geospatial tools. Dynamic thematic planning maps will provide a

The ESD-GIS project provides a cost-effective framework which helps in showing different indicators at the districts, blocks and village levels on maps.

clear picture of any facility, as it would help the planners to gauge the effects of any plan and to effectively monitor the utilisation of funds. This approach for integrated decentralised planning at local level is presently totally dependent on government agencies for all kinds of information.

With the unprecedented pace of economic development witnessed in UP, the demand for accurate and up-to-date maps and use of geospatial products has increased exponentially. The ESD-GIS project provides a cost-effective framework which helps in showing different indicators at the districts, blocks and village levels on maps. It facilitates a delivery mechanism for disseminating information up to local level in the form of map for planning and decision making. This will aid in achieving equitable development across the different regions of the state. ⑤

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