



Participative GIS as a Tool to Monitor and Improve Quality of Life in Urban Areas

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Abstract:

Indian towns and cities are expanding at a rate never before. Civic administrators are facing challenges to provide civic services to the citizens. City administrators point to lack of resources as a primary cause for poor service delivery. Central and state governments provide financial support in form of various schemes. Such scheme in most cases fails to address the basic issues of improving quality of life in a holistic manner. Need of the hour is to develop a decision support tool which can not only monitor the implementation of schemes but also do an advance proactive modeling to judge their results. To do so we have adopted a participatory GIS approach. Quality of life indicators are identified and weighted using standard practices and extensive survey is done to collect grass root level data. The statistical analysis is done in any off the shelf available software. Further a personal Geodatabase is created. To display and query and model the spatial and attribute data a stand alone GIS model was developed in Turbo Delphi. For this software no commercially available library or third party tool has been used. Software provides all necessary features required to model and expand the scope to any number of wards in a city and any number of indicators. Software helps anticipate the effect of schemes or programs after implementation and hence acts as a decision support tool to administrators by use of participative GIS.

Introduction:

Indian cities and towns are expanding at a rate never before. Civic administrators are facing challenges to provide civic services to the citizens. City administrators point to shortage of resources as a primary cause for poor service delivery. Citizens argue improper allocation of resources & poor decision making in terms of spatial distribution. Central and state governments provide financial support in form of various schemes. Such scheme in most cases fails to address the basic issues of improving quality of life in a holistic manner. The most sought reason is that such schemes are prepared at tables of



administrators sitting at National/State headquarters, having little or no relevance to the actual needs and priorities of the citizens.

Realizing this fact many countries have adopted innovative approaches in past few years. These include strategic spatial planning, public participation in decision making, implementation, prioritization & audit of the development schemes. Community participation has proved as an important tool to inculcate increased sense of ownership in development process.

Need of the hour for Urban Planners & decision makers is to know how best to use limited resources to address the complex urban challenges and opportunities. To achieve this decision makers need a comprehensive information & decision support system backed by public participation. World over there has been a realization that civic life should improve in qualitative terms rather than in quantitative terms. Monitoring the improvement in quality of life is done through a set of indicators. Many international agencies have developed a set of indicators & each of them is monitored regularly. An important fact in any study or decision making about any project is the fact that of parameters or part of city cannot be considered in isolation. Impact of one is bound to happen on another, be it positive or negative. There is a very strong direct or indirect interdependence of urban parameters on each other.

Understanding this, we thought that there is a need to develop a tool that can help decision makers to take better decision about resource allocation with respect to its spatial and sectoral distribution. It should be a decision support tool for Indian cities in the local & regional context, which can not only monitor the implementation of schemes but also do an advance proactive modeling to judge their results. The tool should also ensure public participation at grass root level.

In our efforts in this direction we have developed a participatory GIS model for support & evaluation of urban schemes based on their impact on Quality of Life. The model has provision for continuous assessment of activities i.e. based on predefined indicators. Quality of life indicators are identified and weighted using standard practices and extensive survey is done to collect grass root level data. The statistical analysis is done in any off the shelf available software. However same can be incorporated in the software itself.

The quality of life indicators used are broadly are classified into following categories with a possibility to add more:-

1. Physical e.g. Water supply, Sanitation, Open spaces etc.
2. Social e.g. Literacy, Health etc.
3. Environmental e.g. Pollution, Landscape etc.
4. Economical e.g. Work place, Employment etc.
5. Cultural e.g. Heritage, community organization etc.

Further a personal Geodatabase is created. To display and query and model the spatial and attribute data, a stand alone and easy to use software was developed in Turbo Delphi for Windows. This software is very easy to use and can be easily operated by any body who is not an expert in GIS. For developing this software no commercially available library or third party tool has been used. Entire coding was done in Turbo Delphi. Entire software package comprise of only one executable file and one MDB file. The spatial data and associated attribute data is stored in personal Geodatabase (MS Access .MDB file) format. This database can also be opened and edited in ArcGIS. The spatial data presently being used is only the ward boundaries in the form of polygons, but other data types such as lines and points can also be added. The software provides facility to display the ward wise city map with zooming and panning (Fig.1). User can view and edit the various parameters of different indicators by selecting the ward polygon form the map.

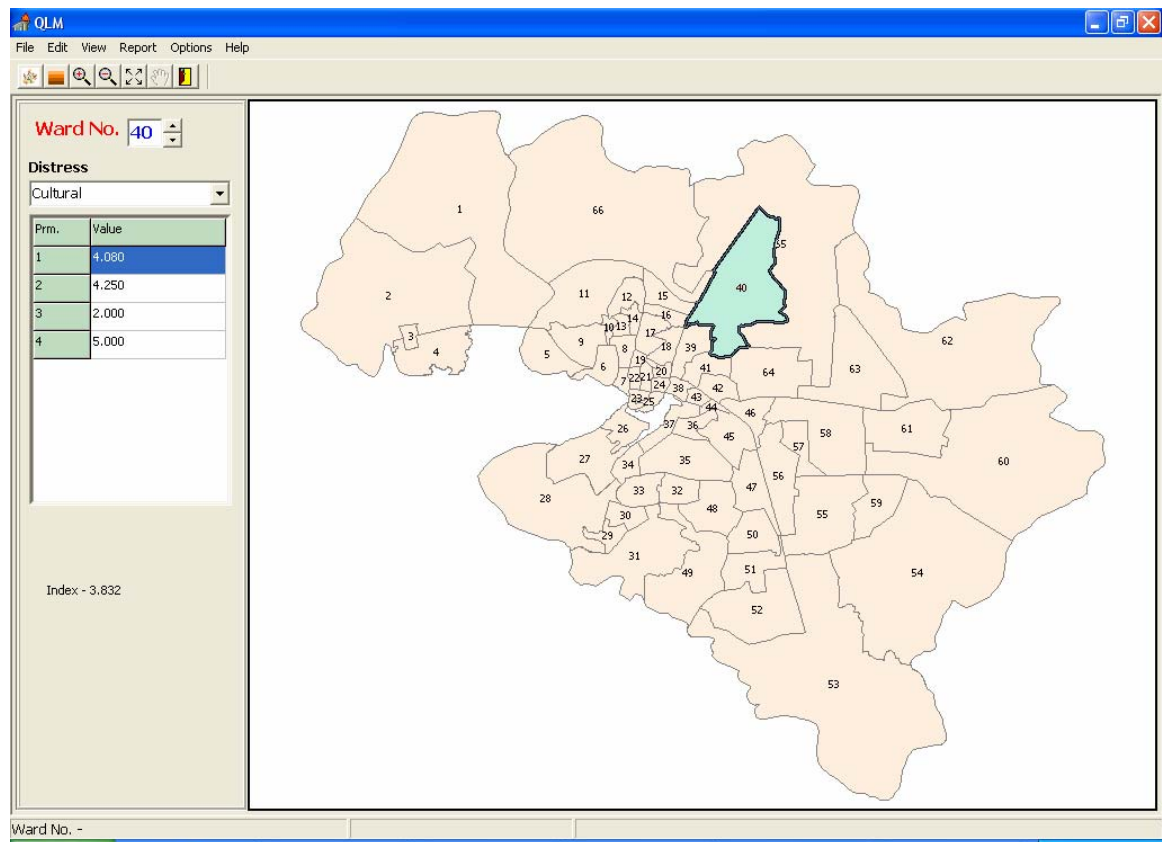


Fig 1 – Screen shot of the main window showing the ward map and attribute data of selected ward.

The spatial data i.e. map data can not be edited but can be imported from the shape files or Personal Geodatabase formats. There are options for configuring the map display like line color, line thickness, fill color, background color etc. To view the spatial variation in the attribute the polygons of the wards the data associated with indicators can

be classified into various groups. This classified data is displayed in the form of choropleth map. Different color schemes can be chosen for the choropleth maps (Fig. 2).

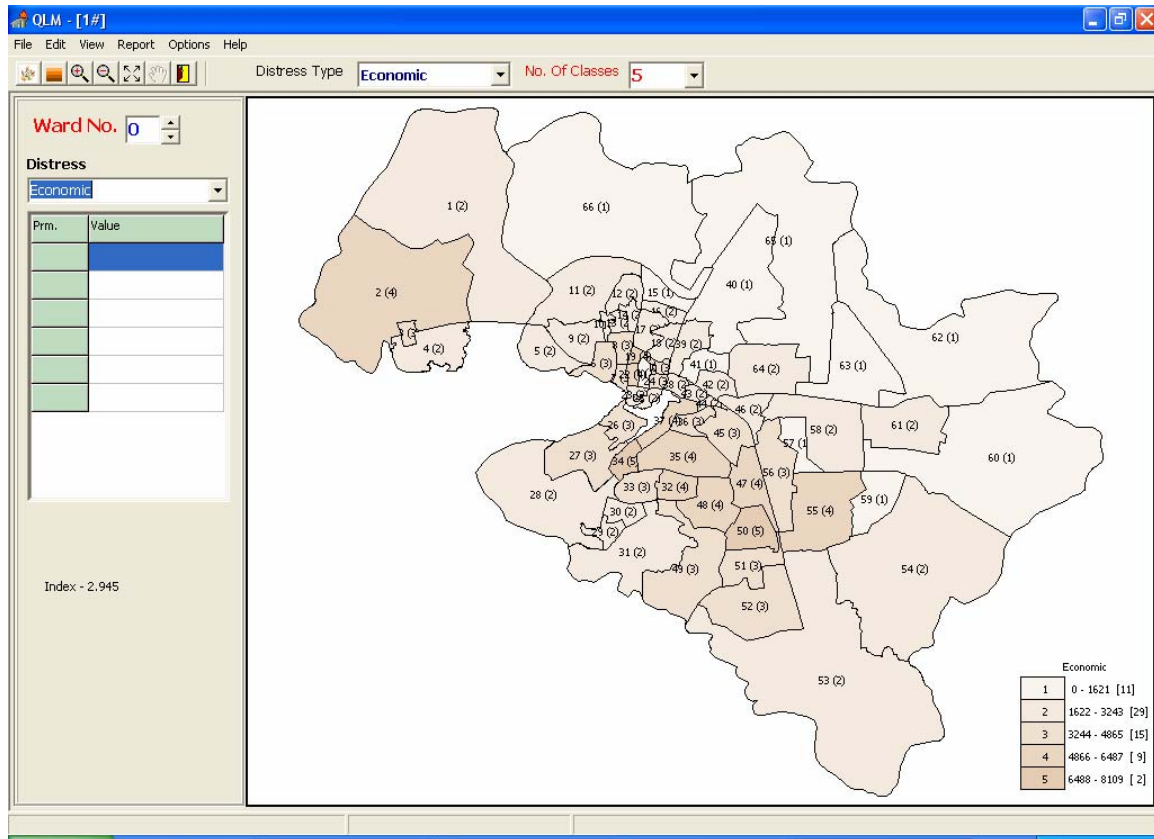


Fig 2. Screen shot showing the Choropleth map generated for Economic Indicator.

The final maps can be exported to BMP/JPEG files. The software also has the facility to print the maps directly on printer in desired size and orientation. Software provides all necessary features required to model and expand the scope to any number of wards in a city and any number of indicators. The software helps anticipate the effect of schemes or programs after implementation and hence acts as a decision support tool to administrators by use of participative GIS and take decisions about city development or review implications of any scheme in any part of city in a more logical & justified manner using an indigenous, low cost & tailor made solution.

Reference:

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- 3) Planning Sustainable Cities: Policy Directions. UN Habitat Report 2009