

Chapter 6 Conclusions

GIS technology provides effective instruments for data capture, processing, and communication within urban planning and management processes. Furthermore, recent breakthroughs in high-resolution satellite imagery and digital photogrammetric techniques, combined with a rapidly developing GIS technology with flexible and versatile spatial analysis capabilities and ease of use, provide new possibilities for using these tools in urban applications. In comparison with simple maps, a GIS offers the enormous advantage of the user being able to select and overlay different types of information (layers) at the click of a button, providing tools that can greatly increase grasp and understanding of the existing situation, the planning needs, and the potential impact of alternative planning decisions. These tools can be very useful for municipalities like Kirtipur that are undergoing rapid changes without having a proper planning framework.

Integrated Action Planning – a participatory planning approach being implemented by municipalities in Nepal – uses a number of manual mapping processes to gain a spatial perspective. In contrast to manual (static) mapping, GIS offers a dynamic mapping capability with sophisticated computer-based spatial analysis and modelling. Both mapping and database development are time consuming and resource intensive. One of the significant advantages of using a GIS is that the database can be used and reused and can be easily updated and modified at suitable intervals. The present study aimed to show how GIS can help in the IAP process, and is an attempt to genuinely integrate GIS into such a process as a model example.

The study demonstrates how a spatial database can be developed for a small municipality in Nepal for use in municipal planning. It illustrates how GIS as a tool can be integrated within an IAP framework and summarises the information requirements for different applications in the municipal planning process. The study also presents a case for the design and development of a generic municipal level GIS database for municipalities in Nepal. The database generated by the study and the methodology employed will provide the basis for a larger scale database for Kirtipur Municipality. The database will be valuable both to Kirtipur Municipality and to the many other agencies involved in planning and development activities in the municipality. An interactive multi-media CD-Rom is being published separately and will provide access to all the datasets, the associated metadata, maps, and reports used in the study, and will integrate them with simple GIS functionality so that they can be viewed from a spatial perspective. This will provide interested municipalities and agencies with a practical example with which they can assess the usefulness and feasibility of GIS for their own planning processes.

The spatial profile of the municipality and the ward profiles provide quick and clear pictures of existing facilities. Using the visual maps and images, it is easy to grasp patterns and trends and identify distributions of services, areas with gaps, and many more. Such maps can be used to help identify priority areas for development or management intervention.

The level of reliability depends on the accuracy of the field verification. Although limited field verification was done for the infrastructure and facilities, it is possible that local people may recognise errors. A system for feedback from those with local knowledge, and a regular system of field verification and updating, would contribute greatly to enhancing the accuracy of the database.

The analysis of urban expansion provides basic information in terms of the urban growth pattern and trends. By using land use maps prepared from aerial photographs taken some years apart, it is possible to analyse land use changes and urban expansion in terms of urban growth pattern and trends, and also develop potential scenarios, as shown in the study. This type of exercise is important both for monitoring and for improving understanding of the dynamics of urban growth, and can help planners and decision-makers develop more rational and effective plans to improve the living conditions of the urban population.

The database will certainly help to some extent to fill existing information gaps and provides the basis for developing a consistent larger scale database for the municipality. The Ward Offices, among others, have clearly found it useful to have large-scale accurate maps of their respective areas. However, there remain clear limitations in using the database to its full potential to support the municipal planning processes, stemming more from organisational problems than technical difficulties. The lack of trained personnel and resources, the basic lack of a 'map culture', the poorly developed planning processes, and the lack of any real implementation and/or enforcement strategy for those planning decisions that are made, all work to limit the amount of benefit that can be gained from the database at the present time.

The situation is similar across Nepal, and clearly points to the need for a concerted effort towards capacity building in planning at the municipal level across the country. We hope that this study will do much to demonstrate the potential of GIS as a decision support system tool for integrated municipal planning, and underline the need to develop the capacities of municipalities and institutionalise the process within the local authorities. It is important to provide the motivation for local authorities to generate and maintain spatial information, and use it effectively in the planning process.