

3. THE NEED FOR A GIS DATABASE

Sustainable and equitable development has to be based on reliable and accurate information, hence application of geo-information technologies is becoming more and more significant. Decisions are influenced by geographic locations. Complex analyses require digital spatial data that define the characteristics of geographic space. Solving the complex problems of an urban environment, such as that of the Kathmandu Valley, requires accurate, up-to-date information with an integrated spatial component, information that is accessible and comparable with basic predictions. For this, a GIS database can provide a useful source of information.

Many organizations have used different methods for acquiring, storing, processing, analysing, and viewing spatial data. Today, exchanging, sharing, and integrating spatial data from various sources have become increasingly important. This is a result of the growing environmental concerns and of pressures on governments and different sectors to perform more efficiently because of limited budgets. Due to the pressure for efficient use of limited resources, cooperation among different sectors is essential for the design and development of spatial databases. Such a need is now constantly expressed in various forums. It is therefore important to introduce a systematic approach to developing a spatial dataset of the Kathmandu Valley that will serve different planning purposes. There is a general consensus among various sectors that better datasets of the Kathmandu Valley are of prime importance for improving assessment, monitoring change, and implementing effective programmes and policies.

3.1 Critical Issues in GIS Database Development

As a technology, use of GIS is gradually replacing the conventional approach to spatial information handling. However, current handling of spatial information among line agencies is neither efficient nor effective. Spatial data are generally not available or are poorly maintained, out of date, and often inaccurate. Maps are on varying scales and have different coordinate systems, making it difficult to make overlays and integrate them. Also, maps on higher scales, which are needed for the type of urban management applications required, are not available. Spatial information is not defined in a consistent manner and naturally is of a low standard. Data (metadata) are not documented, rendering them unavailable for future use.

There are no clear mandates and policies for the institution responsible for defining, maintaining, and revising such data. There is little or no interaction between the institutions or projects and often their mandates, authorities, responsibilities and functions overlap (IUCN and NPC/Nepal 1995). Our experience shows that to bring different sources of spatial data on the Kathmandu valley together and to integrate them are very difficult, if not impossible.

3.2 Existing Scenario

The Survey Department has the primary responsibility for spatial data for the whole country. Some achievements in the context of establishing digital data have been

accomplished. However, a systematic and integrated approach is clearly what is needed now. The Survey Department has a clear mandate to produce maps and related products, but it needs clear-cut plans and policies concerning methodology and development of its work. Introduction to new techniques applicable in the country and in tune with modern trends and developments is essential (Department of Survey 1998)

The Department has a more liberal policy than departments in other parts of the HKH region. Maps and aerial photographs are readily available at reasonable prices. Research and Development projects have used these as per their needs. Lack of standards and limited knowhow on digital databases mean that each study employs its own methods. From certain perspectives, without long-term implications, the resources are wasted and efforts are duplicated. Consequently, results derived from the studies are limited and can not be used for any other purpose.

The Physical Development Plan for the Kathmandu Valley, produced in 1969, is one of the most comprehensive studies for the overall development of the valley and is an excellent example of manual GIS. It was financed by the United Nations and took seven to eight years (It started in 1962 and the work was published in 1969) to prepare the Master Plan. Many studies have been carried out since then, but they lack the balanced coverage of subject areas and comprehensive spatial components are not included. The number of publications that promote the use of a spatial framework for basic planning purposes indicates how important such a framework is for the development of the valley. Significant amounts of resources have already been poured into these studies. A comprehensive list of studies on the Kathmandu Valley is given in 'Regulating Growth – Kathmandu Valley Main Report'. For example - there have been initiatives to map the Kathmandu Valley on a larger scale by the Nepal Telecommunication Corporation (NTC), Department of Water Supply and Sanitation (DWSS), and municipal mapping projects under the Department of Survey (DOS). But, the data derived from these studies are difficult to use because of the isolated nature of each project and the fact that data are not shared. More recently, the Kathmandu Metropolitan Office introduced a project to map the Kathmandu Valley as an aid to planning and development activities. This project received support from the European Union.

It is a general problem that most studies have no comprehensive spatial component, and hence there is little or no relationship between one study or the other in terms of spatial data and information. Projects need to be complementary with appropriate policy focus and guidance. The increasing importance of data and the rapid progression of the technology have provided new ways to manage geographic information and comprehend the existing scenarios. It is against this background that GIS database development took place.