

## 3.05 Software

*GIS and image processing software are still not very user-friendly and are not up to par with other software, such as MS Office. Software vendors are beginning to address this, largely due to market and user demands, but there is still a long way to go.*

*Although GIS software is becoming less expensive, it still constitutes a major share of the initial costs in setting up a GIS for CLUP preparation.*

### 3.05.01 Overview

In most organizations GIS can be used for a number of different staff tasks with various requirements on analysis operations and presentations. Instead of focusing on selection of software, the basic questions are:

-  In which staff work is GIS supposed to be used in order to get good enough support?
-  How is GIS planned to store data and make data available?
-  How is the data planned for use in different applications and staff tasks?

Thus, selection of software should be a result of considerations and decisions about which business activities should be supported by use of GIS and the kind of data that should be used.

In the case of the formulation of the CLUP, there is a number of GIS software available on the market that can be used for land-use preparation. Some of them can be described as common GIS software that includes all basic functionality for data capture, data production, data storing, data processing, analysis operations and presentations. Some of them are commercial software, but there are also freeware and shareware programs available. A few are using open source.

As an alternative, applications can be developed within the organization. However, this is not recommended, as the life cycle costs of such applications tend to be high. Instead it is recommended to purchase commercial software and then make necessary modifications /updates.

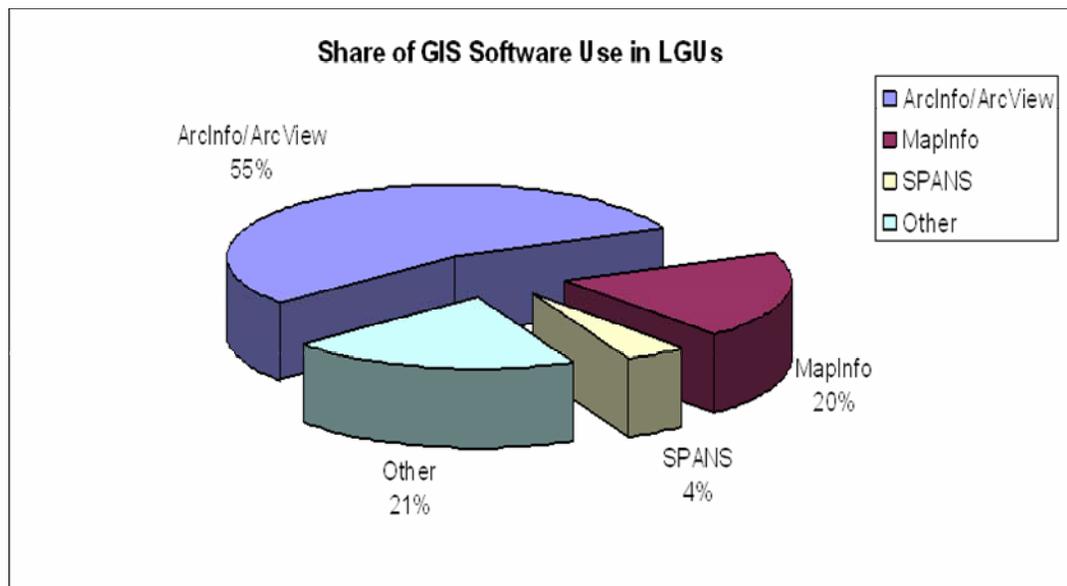
The planned use for the software, and the categories of users are very decisive factors for the selection of GIS software. The range of GIS use is very wide – from browsing pre-drawn maps to advanced analysis operations. This means that it might be necessary to select different software solutions with due consideration of the types of users. However, as a start for a low-income municipality, it would be enough to procure one software license to be used by the planner(s) and use a freeware GIS browser for the CLUP stakeholders.

### 3.05.02 Open Source GIS

Open Source programs are applications in which you can access the source code. In recent years, the GIS industry has witnessed a dramatic growth in the development and adoption of open source technologies and there is a number of Open Source GIS Software available on the market for free or at a low price. The technical GIS community has adopted open source technology and it now mainstreams GIS. Broader IT industries have come on board as open source products have matured. The availability of GIS open source software provides researchers and solution developers access to a wider range of tools than what is currently offered by the commercial companies. However, for the target group of the GIS Cookbook, the low-income municipalities with limited experience of computer technology, it is not recommended to use Open Source GIS as it is still complicated for the beginner to work with. It might be an alternative later when the staff is more confident with the computer environment.

### 3.05.03 Recommendations on GIS Software Setup for CLUP Preparation (Based on Best Practices)

The graph below shows the brands of GIS software that are commonly used by the LGUs in the Philippines some years ago. The findings originate from the NAMRIA nation-wide survey and if the trend is the same as with the rest of the world, the situation today will give an even bigger dominant position to ESRI which is the provider of ArcView, ArcGIS, ArcInfo, etc. As Microsoft Word drove Word Perfect out of the market some ten years ago it is also likely that ESRI will outmaneuver most of its competitors in the long run, simply because much resources are needed to keep software apace with users' preferences and needs.



A geographic model is an abstraction of the real world that employs a set of data objects that supports map display, query, editing and analysis. To date there have been three generations of software in use, separately or integrated together and different GIS software make it possible to a greater or lesser extent to represent natural behaviors and relationships of features. These models are as follows:

- ✎ The **CAD Data Model** is the very first computerized mapping system that draws vector layers. However the representation of the attribute data is very limited. In this era, maps were created with CAD software;
- ✎ The **Coverage Data Model** introduced better options to combine spatial data with attribute data. The major advantage of the coverage data model is the user's ability to customize feature tables. Not only could fields be added, but the database relationship could be set up to external database tables. The Coverage Data Model is still the dominant model in GIS. An example of the software that handles this data model is ArcView 3 using shapefiles.
- ✎ ArcGIS/ArcView 8 introduces a new object-oriented data model called the **Geodatabase Data Model**, which makes the features in the GIS datasets more proficient by endowing them with more natural features.

*The GIS Cookbook recommends that data be prepared in a Coverage Data Model (Shape files, Excel/dBase attributes). However, as ESRI has terminated the development of the ArcView 3 environment, it is recommended that GIS software that also can manage Geodatabase Data Model such as ArcGIS be procured by a low-income municipality.*

The reasons are briefly as follows:

- ✎ More flexibility for future improvements and upgrading of the GIS is possible;
- ✎ The amount of data required for the CLUP is not voluminous so it requires a Geodatabase Data Model;
- ✎ The queries and analysis used for the CLUP are relatively simple and do not require a Geodatabase Data Model;
- ✎ The amount of data sharing does not initially need a network solution.

However, it is more advantageous to use a Geodatabase GIS Software when it comes to displaying and visualizing the information products of the CLUP

*A checklist with items and costs is enclosed in the Toolbox, Chapter 6.03.*

#### **3.05.04 Maintenance and Licensing**

Most commercial software manufacturers are offering (often quite expensively) annual maintenance agreements that provide general support and troubleshooting. For the CLUP GIS however, it is not recommended for a low-income municipality to sign up for such an agreement as the problems that will occur will mostly not be related to the actual software but to inconsistencies among the other GIS elements, namely:

training, data, hardware and the actual application - the CLUP GIS. In this case, the main provider of useful advice will be HLURB.

Licensed software comes normally with a password and a dongle which only allows the software to be used in one computer at a time. In the Philippines like the rest of the world, there are cracked versions that enable the use of the software without any restrictions. Although the price of the software is a hefty investment for a low-income municipality, it is not advisable to use pirated software, which is illegal.