

2.1.4 Rasterization (in technical cooperation with IGN) and vectorization

(1) Rasterization

1) Production of positives

Positives were produced for 74 sheets of existing 1/50,000 national base maps (topographic maps). Each sheet as a general rule will be comprised of 5 colors (black, blue, brown, green). IGN had already started the positive film production and scanning when the study team arrived in Guatemala in January 2001. The positive films that were scanned previously consisted of black film (topological features, man-built features, etc.), sepia film (contour line etc.), and blue film (water area etc.). The rest of the topographic information was stored as a form of negative films and element films (mask films). Considering creation of positives from negatives, the study team confirmed that IGN has film and learned that some negatives do not exist, depending on the individual map sheet. Also information about vegetated area only kept in the form of element films (mask films). Appendix (provided by Cartografía, IGN) show the number of negatives and element films of each map sheet for the project target area. Since time and the budget are limited, the study team discussed with IGN to find the most efficient method for obtaining raster data. After due consideration, IGN and JICA study team agreed that negatives and element films should be scanned directly, instead of producing positives and scanning them.

2) Scanning

This work was carried out with IGN's technical cooperation; the prepared positives were scanned (rasterized) and stored as image files.

a) Provisional scanning

The study team and IGN examined some negatives and element films by scanning them as samples. We tried resolutions of 800dpi, 600dpi, and 400dpi with the black and white option for negatives. For the element films, the black and white option didn't capture all the features, so we applied grayscale at 400dpi.

As a result, it was decided that negatives be scanned by black and white at 600dpi and element films by grayscale at 400dpi. The study team examined the scanned data of positives, which had been started previously by IGN, and assured of their usability as raster data.

b) Main scanning

The data was converted into image (raster) data at a preset resolution and saved in TIFF and JPG format. The study team checked and reconfirmed that, within the 74 map

sheets, there are none that stretches over the neat lines. The rule of file naming is as follows without exception. The first two letters of the name of each raster file indicates the color for printing and the element film number, and the rest indicates the map sheet number. The relation between a file name and its contents is shown at the columns of “Nombre del Archivo” and “Archivo Contenido de los Datos” in Appendix (provided by Cartografía, IGN).

After discussion with IGN, the study team presented IGN with the following reminders and suggestions for preparatory work and scanning.

◆ **Creating registration marks**

Before the scanning, it is essential to make sure that each map sheet contains registration marks at four corners. If not, IGN adds them by using graphics software accordingly.

◆ **Scanning**

According to the film type, scan the film with the preset resolution and file format (see Table 2.1-8).

Table 2.1-8 Preset resolution and file format for scanning

Film type	Resolution	Format
Positives	300dpi(black&white)	tiff(uncompress)
Elements	400dpi(grayscale)	jpg
Negatives	600dpi(black&white)	tiff(uncompress)

Reminders for scanning

- Keep a constant direction when inserting the film into the scanner
- Engineers in charge of scanning should check and fill out the scanning data check sheet (Appendix).

(2) Basic Policy on Vectorizing of Basic Spatial Information Database

When vectorizing the basic spatial information database, the individual information (graphics) of the topographic maps was created as graphic information (library) to maximize its reuse, so that the common items of GIS data and printed map data were made available as digital data for common use. This made it possible to adopt the work process of adding individual information and minimize the work of maintaining and updating the existing information and adding new information. Before starting the vectorizing process, the Study Team developed a program for efficient data acquisition to enhance the reproducibility of the existing topographic maps and to establish the technique of building a GIS database with high accuracy.