5. Establishment of Compartments and Sub-compartments

In the formulation of a Forest Management Plan, the standard procedure is to divide the forest area into manageable-sized units using a Compartment System. Compartments identify the name (e.g. Set-up No.1) and address (i.e. location) of each management unit. Generally, compartments range in size from 80 to 100 ha. However, the final size of compartments depends on forest conditions and management policy. If the areas are to be intensively-managed by many users, these compartments may be small units. In many parts of the Philippines, mangrove forests are intended to be managed for conservation purposes. Where this situation prevails, it is not necessary to divide into small compartments.

Sub-compartments are basically units that will be given the same or similar sets of silviculture treatments under the management plan. Generally, sub-compartments are established on contiguous parts of a larger compartment having almost identical stand structure such as dominant species, age, similar tree height and similar biological conditions. In this Study, mangrove forests are divided to sub-compartments based on the stand structure as observed on aerial photographs. Different patterns of color tone, crown shape, crown size and surface texture are taken into account. Then, the Study areas are divided into parts having dominant patterns. The size of each sub-compartment is different, depending on the extent and distribution of the several patterns that were observed. Two basic factors were considered in establishing sub-compartments : (a) the intention to map the areas on a scale of 1:10,000 (with an average size limit of 2 X 2 cm per small sub-compartment) and (b) the intention to avoid creating too many small sub-compartments, except where this became necessary due to the presence of fish ponds.

The general procedures that were followed in the Study to establish compartments and sub-compartments are discussed below. These may provide sample guidelines for others who intend to conduct similar exercises in aerial photography interpretation.

a. First, the Survey areas were identified; i.e. Aparri, Lamon bay, and Ulugan bay.
b. Each area was divided into several Zones, based primarily on the boundary lines of large municipalities.
c. Each zone was divided into several compartments based on topographical lines such as a river, or based on the presence of a road or some other easily-

recognizable construction.

d. Each compartment was divided into sub-compartments.

e. Each sub- compartment was given a name; M-1 to M-n for Mangrove forests; F-1 to F-n for Fishponds; N-1 to N-n for Nipa areas; and O-1 to O-n for Other land uses.

6. Interpretation of forest stand conditions

After completing field verification, sub-compartment lines must be re-adjusted on the aerial photograph. Then the interpretation work approaches the final stage. The last, and most demanding work is interpretation of forest stands conditions sub-compartment by sub-compartment, based on the factors discussed previously such as crown density, tree height, main species, etc.. The procedures for this work are as follows:

a. Results from pre-interpretation of aerial photographs must be re-examined and amended based on results obtained from field verification, and information derived from field surveys (plot surveys).

b. Using the mirror stereoscope, compare the aerial photograph with the detailed data obtained from plot surveys. Alternatively or concurrently, compare the aerial photographs of the study site with the image appearing on Aerial Photo Interpretation Cards. After making these comparisons, determine the factors needed for management planning.

c. Examine and cross-check interpretation results with field survey results.

d. Discuss the results with other analysts to arrive at a consensus on interpretation.

e. Finally, fill up the forest inventory book columns.

The color of aerial photographs can change because of aerial photography conditions, photograph development processes or other processes applied to the photos. To deal with this problem, analysts/interpreters have to analyse not only the aerial photographs but also related data and information. In this connection, the importance

of actual observation in the field, and field verification including surveys cannot be over-emphasized. These measures will enable the analyst/interpreter to overcome problems arising from color change and other technical imperfections in the photos while also providing the basic knowledge required for efficient interpretation.

7. Transferring sub-compartment lines on the aerial photographs to the Base Map

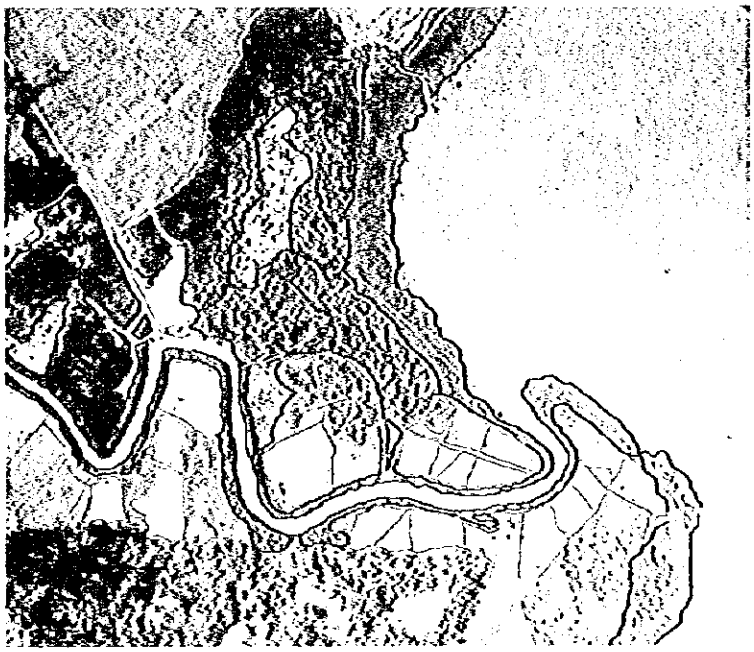
After completing amendments, the sub-compartment lines on the aerial photographs have to be transferred to the base map. This map should be on the same scale as the aerial photographs. To make the transfer it will be necessary to prepare an Aerial Photo Mosaic as described hereunder.

Draw the base map on transparency paper. Place the aerial photographs under the Base map transparency. Trace the lines previously entered on the aerial photographs onto the Base map transparency. As previously explained, slanting has an effect on the information presented by the aerial photographs. Slanting is minimal at the center of the photograph and increases as one moves to the frame (edge) of the image. Therefore, tracing is confined to the central part of the photograph in order to avoid tracing those portions of the photograph near the frame (edge) that are subject to the slanting effect. Those portions subject to the slanting effect are covered by making use of the overlap features of aerial photographs. When placing the photos under the transparency paper, place them in an over-lapped position so that all the portions that are traced correspond with the central parts of the picture not affected by slanting. This procedure is identical to the procedure followed when ordinary photographs of a landscape (not aerial photos) are joined together end-to-end to show a range of mountains or a ridgeline that is too long to be captured in a single photograph.

The following figures (Fig.-37-- Fig.-34) show some samples of the transfer of sub-compartment lines to a base map. Lines of mangrove areas and sub-compartment lines drawn during pre-interpretation were amended in the final interpretation.

Fig -32 Transfer of Sub-compartment (Sample 1: Lamon Bay)

M. Lopez, Compartment 902, 903



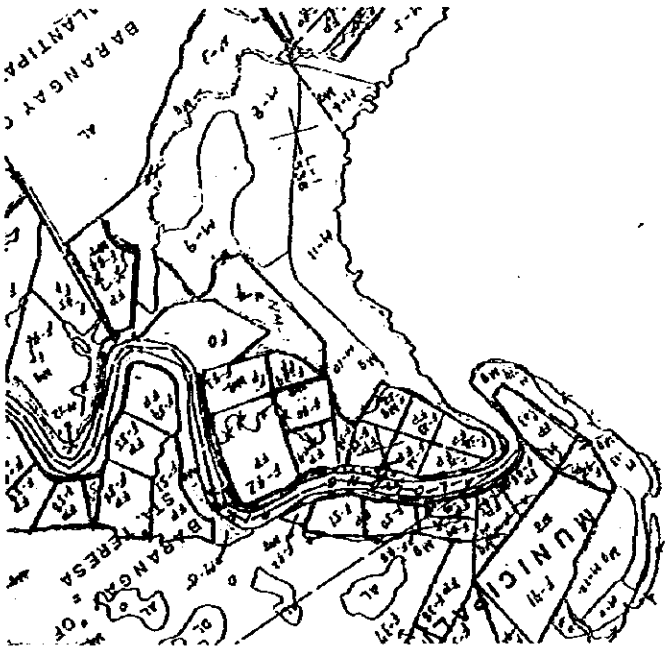
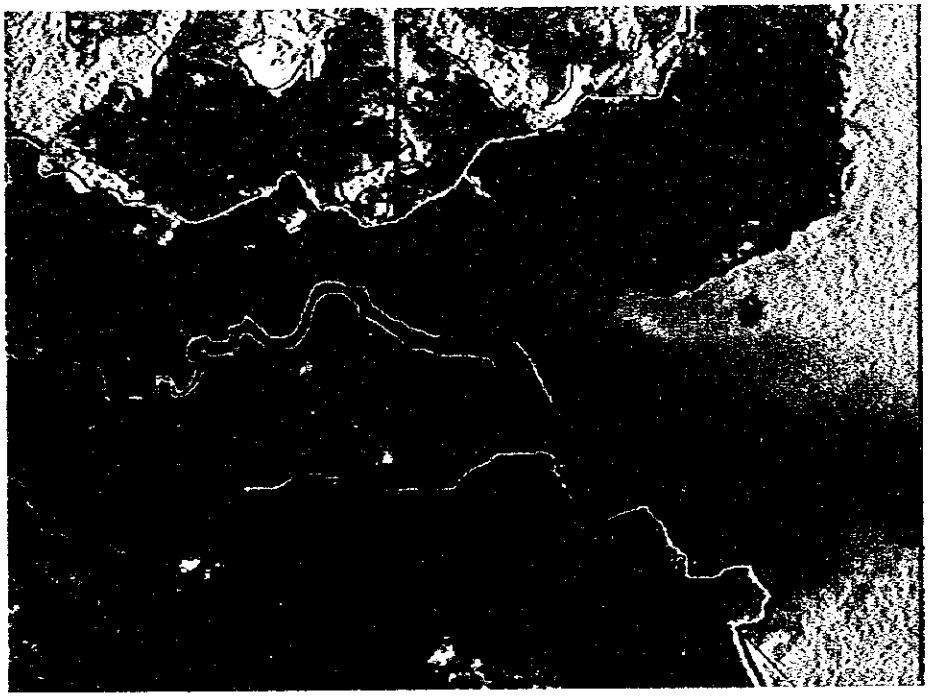


Fig. -33 Transfer Sub-compartment Sample 2 (Lamon Bay area)
B. Lainglaingan, Comp. 408-410, Tinigiban Zone



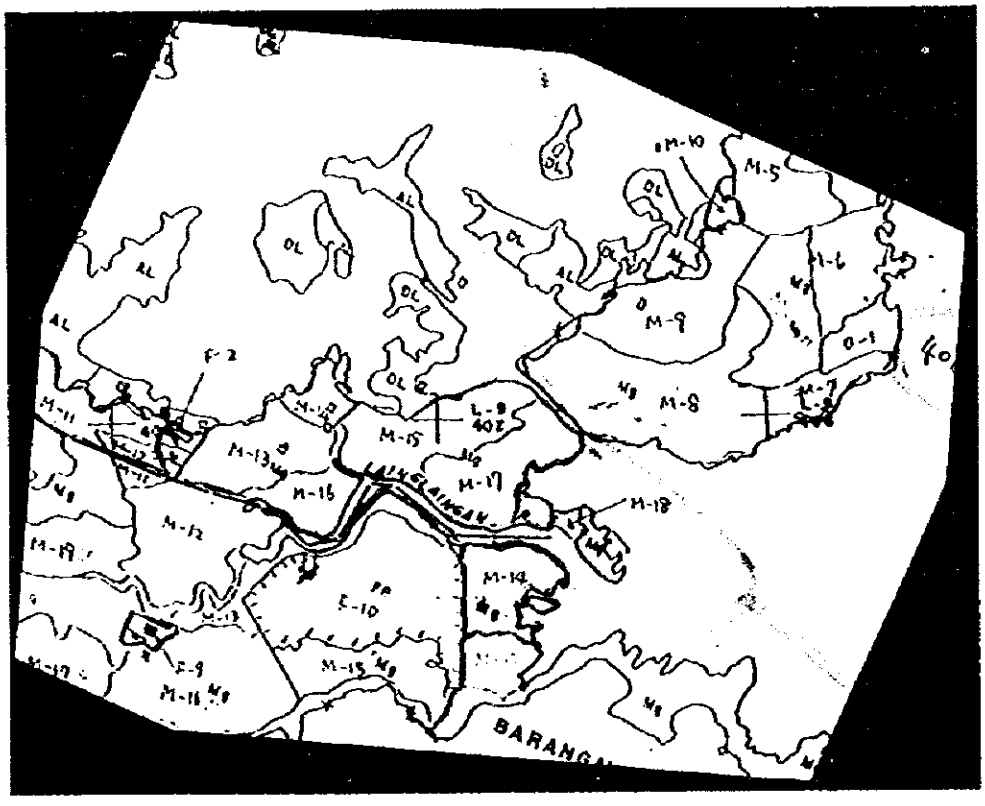
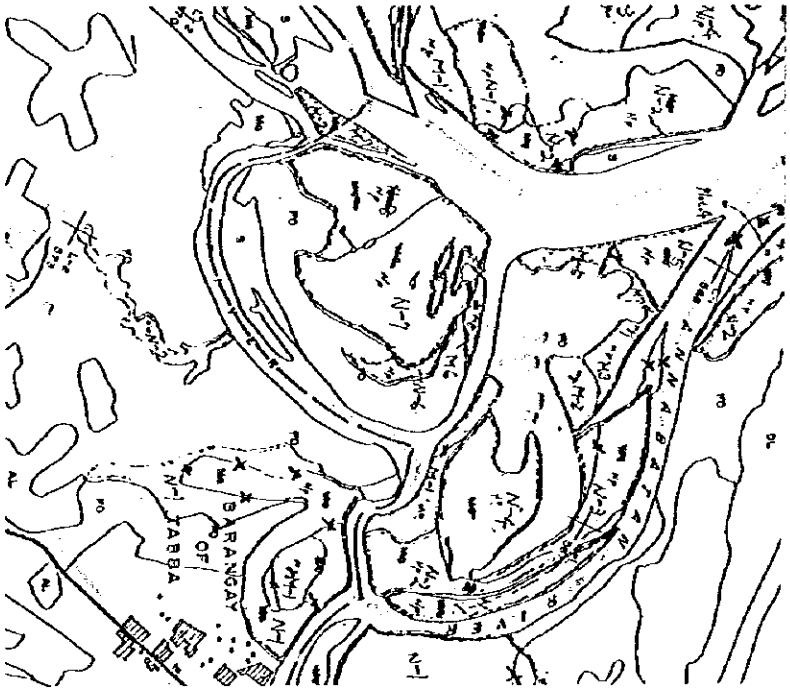


Fig. -34 Transfer Sub-compartment Sample 3: Aparri area
B. Tabba, Comp. 107, Pamplona zone



Bibliography

Hiroshi Watanabe 1988 New Textbook on Aerial Photograph Analysis and Land Survey (Japanese version) Japan Forest Technical Association

Kazuo Furukata 1998 Production of the Topographic maps by the "Aerial Photogrammetry" Technical note for Watershed Management in Mantasoa and Tshiazompaniry in MADACASCAR , JOFCA (unpublished)

Shinsuke Matuzawa 1988 How to Make a Vegetation Map, Technical note for Watershed Management in Mantasoa and Tshiazompaniry in MADACASCAR , JOFCA (unpublished)

Iwao Nakajima 1973 Outline of the Aerial Photogrammetry, (Japanese version) Chikyu Books publishing Inc. Tokyo

Iwao Nakajima 1966 Forest Information Survey for Management Planning by Photogrammetry and Remote Sensing Aided, Forest Training Institute of the Forestry Agency, Japan & Japan International Cooperation Agency (JICA)

Americana Society of Photogrammetry 1952, Manual of Photogrammetry, Washington

American Society of Photogrammetry 1960, Manual of Photographic Interpretation, Washington