PREPARATION OF FOREST INFORMATION IN WIDE AREA AND FOREST MANAGEMENT PLANNING IN THE REPUBLIC OF THE PHILIPPINES

GLOSSARY

JAPAN INTERNATIONAL COOPERATION AGENCY

(JICA)

CONTENTS

Base Map Compilation

(Wide Area)

The base map was compiled at the scale of 1/100,000 from the existing 1/50,000 topographic map sheets in the following manner.

1. On the polyester base overlaid on the topographic maps of 1/50,000 in scale, main contour lines (intervals, 200m for mountains and 100m for flat land), cities, villages, major roads, waters, drainages, and other terrain features were delineated.
2. The above were photographed and negatives made, reduced to 1/100,000, and compiled with title box and notes, to make the original Base Map sheet.
   The study area is covered with 9 sheets in 1/100,000 and 2 sheets in 1/200,000 (No.1-5, 6-9).
3. From the original Base Map, the second original Base Map was produced to serve as Base Map of each Thematic Maps.

Basic Data

(Wide Area)

On the basis of Reconnaissance Maps, field survey findings and Landsat digital analysis, Reconnaissance Maps were modified and supplemented to generate the following Thematic Maps.

1. Drainage and Catchment Area (1/100,000)
2. Geomorphology (1/100,000)
3. Vegetation and Landuse (1/100,000)
4. Geology (1/200,000)
5. Soil Texture (1/200,000)

6. Meteorology (rainfall, tropical cyclone) (1/200,000)

7. Administrative Boundary

8. Road Networks, Development Plans, Laws and Regulations (1/200,000)

9. Study Unit (1/200,000)*

   * Map to show the area in the smallest units for study of land conditions

Coordinate measurement

(Wide Area and Model Area)

Other data than elevations were captured as areal and linear features, and encoded by means of a digitizer (a coordinate encoding device). The encoding format and items are as follows.

. Items of data captured and input as areal features.

  (a) Geomorphology

  (b) Vegetation and Landuse

  (c) Surface Geology

  (d) Soil Texture

  (e) Administrative Units (boundaries)

  (f) Development Plans and Lands/Regulations

  (g) Study Unit

. Items of data captured and input as linear features.

  (a) Drainage Patterns

  (b) Road Networks

  (c) Tropical Cyclone Route

The procedure of the coordinate measurement was as follows.

1. Compilation of basic map for measurement: Prior to measurement, the thematic maps were checked for compatibility, and aberrations in points and lines were corrected.
   Subsequently, the data were chassified into point, linear and areal features and identified by numbers and symbols in the measurement (at the same scale as the thematic maps).
2. Encoding of attributes data:
   Attributes (according to the legends of thematic maps as identified by numbers and symbols) corresponding to point, linear and areal features as identified by numbers and symbols were read and recorded in the coding sheet.
   The coded data were input and recorded on magnetic tape.
3. Coordinate measurement:
   From the basic map for measurement, point, linear and areal features were measured for coordinates by a digitizer. The coordinate data as measured were recorded on magnetic tape.
4. Checking and correction of data
   Measured coordinate data and attribute data were output by an automatic plotting machine as thematic map data. The output results were compared with those of thematic maps and basic map for measurement for correction of errors made in the process of measurement or encoding.

Data Filing

(Wide Area)

Digitized data on magnetic tape, shall be edited in a form to make subsequent analytical works easier. The main works are as follows.

1. Measurement are taken for each map sheet and edited on the basis of coordinates for the entire study area.
2. When there are multiple kinds of data involved, measurement and encoding become confusing among numbers and symbols for identification.

   Therefore, when all data are made available, identification numbers and symbols are reviewed for simplification.
3. Usually, data are quantified and made into a file for each thematic map. But in case there is possibility of data within that thematic map differently, they are made into different files accordingly.

   Example : From the map of Development Plans and Laws/ Regulations, there are two files created, a Development Plans data file and a Lows/ Regulations data file.

A group of data files thus created by digitalizing thematic map information in a most generalized format to facilitate subsequent work is referred to as a "data base". Originally created for the limited purposes of this study, the data files development in this project will possibly be made into a more permanent "Cagayan River Basin Data Base" to serve as on-going reference by augmenting and updating the data.

Forest Block

(Model Area)

Since the forests that the Forest Management Plan deals with are wide-spread in area and varying in nature, the forest lands require to be divided into blocks of an appropriate size for efficient forestry management. For each individual project, target forests must be identified in terms of location and area and given numbers for the convenience of keeping records of operations and changes done to forests. Forest lands are divided into areal units of the following three levels.

1. Parcel

   This is the largest unit on the order of 10,000 hectares in this particular plan defined on the basis of a major watershed relevant to the implementation and management of forestry. Parcels are identified by Roman numbers (I to V in this project).

2. Compartment

   Since this is intended as a permanent unit of segmentation, particular attention needs to be paid so that they are orderly defined. Boundaries are to be set on easily recognizable terrain features such as ridge lines, valleys, and other natural boundaries, or fixed objects like roads. This type of unit varies depending on the status of forests to deal with and intensity of a project, and in this particular plan, it ranges from 400 to 500 hectares.

   Compartments are identified by serial numbers (1 to 82 Compartment in this project).

3. Sub-Compartment

When depending on the purpose of a project and Compartment deemed too general, it is further devided into Sub-Compartments. Such division of a Compartment into Sub-Compartments is based on the distinctions of tree species, ages, positions, accessibility to transportation as well as of land use and administrative boundaries. As far as this unit is concerned, division and integration are made as appropriate depending on the project. Sub-compartments are referred to in capital letters of alphabet. When further division is necessary, resulting sub-sections are identified by small letters of alphabet (1 to 723 Sub-compartment in this project).

Forest Information Data

(Wide Area and Model Area)

The findings of studies made to understand the natural and social environments for forest management plan with respect to each management block have been tabulated into "Forest Information Data" as show in the Annex.

Forest Landuse Classification Analysis

(Wide Area and Model Area)

From the results of Land Characteristic Analysis, the existing vegetation impact on natural hazard potentials have been classified.

1. Vegetation Impact on Soil Erosion Potential
2. Vegeation Impact on Hazard of Land Collapse & Slide.
3. Vegetation Impact on Water Holding Potential

Forest management Block

(Wide Area)

306 Management Blocks were set for forest management plan and they correspond to "Small Watershed".

Forest Management Plan

(Wide Area)

The Forest Management Plan sets forth the objectives of forest management for each Management Block based on the Forest Information Table.

Forestry Classifications and Work Standards

(Model Area)

Forestry operations are organized in major grouping so as to standardize the work process for better efficiency thus maximizing the utility of forests. For this project, the following classifications are made:

1. Timber Production Forest
2. Fuel-wood Production Forest
3. Protection Forest
4. Parks and Outdoor Recreation Area
5. Grazing Land
6. I.S.F.(Agroforestry)

Geographical Characteristic Analysis

(Wide Area and Model Area)

The data files created are in a most generalized format (capable of multi-purpose application). Therefore, in order to perform analysis of data for specific purposes, it is required to manipulate the stored data to suit those specific purposes. This process of data manipulation is commonly referred to as "Basic Analysis" (Geographical Characteristic Analysis).

In this study, the Basic Analysis as such was made as follows and the results were incorperated into newly created files and output in map sheets.

1. Elevation
2. Slope

3. Aspect

4. Sun Intensity

5. Exposure

6. Bird's Eye View

7. Naturality

8. Rainfall and Tropical Cyclone

9. Monthly Tropical Cyclone Route

Land Characteristic Analysis

(Wide Area and Model Area)

The following Analysis have been made to find out about land characteristics to provide a basis for subsequent forest land use classification analysis.

1. Soil Erosion Potential (1)

2. Soil Erosion Potential (2)

3. Integrated Soil Erosion Potential

4. Hazard of Land Collapse and Slide (1)

5. Hazard of Land Collapse and Slide (2)

6. Integrated Hazard of Land Collapse and Slide

7. Water Holdng Potential (1)

8. Water Holding Potential (2)

9. Integrated Water Holding Potential

10. Flooding Potential

11. Tree Growth Potential

12. Natural Potentials

Landsat Digital Analysis

(Wide Area)

By using Landsat Data covering the Model Area of past years, digital data analysis was made of the changes in vegetation and landuse. The Landsat Data employed were as follows.

1. August 26, 1976
2. February 21, 1979
3. April 15, 1983

Ratio computations based on the band ratio of Band 5/ Band 7 were performed to create images classified into forests, non-forests, and rivers, for each period of time.

Landsat Imagery Interpretation

(Wide Area)

1. Landsat CCT's (computer compatible tape) covering the study area were selected and acquired (observation data: April 15, 1983).
2. From these tapes after radiometric, geometric, and other correction, and rectifications, color infra-red images (combination of Bands 4, 5 and 7) were produced at scales of 1/200,000 and 1/100,000.

3. Landsat Images were interpreted for the following items.

   a. Vegetation and Landuse

      - Forest
      - Grassland, bareland,
      - Cultivated land, farms, villages
      - Rivers, water bodies, roads, etc.

   b. Geology

      - Faults, Lineaments
      - Zoning of geological block

Mesh Data

(Wide Area)

The elevation data were input to the computer as mesh data. The specific work procedure was as follows.

1. Dividing the area into grid cells on the topo map.
   Each 1/50,000 topographic map was divided equally by 20 lines vertically and 25 lines horizontally to form 20x25= 500 grid cells. The resulting grid cells represent an area of about 1Km x 1Km each.
2. Encoding of elevations:
   The elevations at the center point of each grid cell were read in the unit of 10 meters and recorded in the coding sheet.
3. Storing on magnetic tape:
   Elevation data as recorded in the coding sheet were input from key board and stored on magnetic tape.

4. Checking and correction of input data:

The data encoded and stored on magnetic tape were output for checking and correction.

The elevation of the study area were represented by approx. 29,000 grid cells.

Reconnaissance Map

(Wide Area and Model Area)

Results and findings of existing data study, Landsat image interpretation and aerial photographic interpretation, were incorporated and compiled into Reconnaissance Maps.

1. Drainage patterns, watershed classification
2. Geomorphological classification
3. Vegetation and Landuse
4. Surface geology
5. Soil texture
6. Watershed deterioration (land collape, sand/gravel outflow, landslide, etc.)
7. Meteorology (temperature, rainfall, tropical cyclone)
8. Administrative boundaries
9. Road networks
10. Laws and regulations, Development plans

Small Watershed

(Wide Area)

On the basis of geomorphological classifications, study units were aggregated into 306 Small Watersheds.

Study Unit

(Wide Area)

The basic land units for data analysis were delineated based on ridges, and drainage. The study area was divided into approx. 3,000 Study Units.

Watershed

(Wide Area)

Small Watersheds were aggregated into 12 main river basins and watersheds.

Zoning & Forest Landuse Classification

(Wide Area)

Setting of Forest Management Block and Zoning of Forest Management.

Zoning of Forest Management

(Wide Area)

The Forestland was classified into Existing Forestland and Existing Grassland, for which classifications were set as follows for the purpose of forest management.

1. Existing Forestland

(A) Areas with high potential for natural hazards requiring prohibition of cutting for forest protection.

(B) Areas with fairly high potential for natural hazards allowing selective cutting subject to soil conservation.

(C) Areas with low potential for natural hazards permitting clear cutting and reforestation subject to planned management.

2. Existing Grassland

(D) Areas with the continuing presence of soil and land hazard (out flow of sand & gravel) requiring active afforestation to prevent hazards.

(E) Areas with the continuing relative absent of soil erosion and land hazard requiring afforestation stressing soil enrichment.