

Appendix viii. Flow Chart of Gene-Ecozone Model

(Based on ArcView 3.2., extension spatial Analyst, Geoprocessing)

A. Average Annual Rainfall Map

Step 1 Meteorological data (rainfall, temperature) from MoE, MRC, and DoM was used to create the climate table. The MoE dataset (54 stations) was used for the climate model (Excel). The actual number of meteorological stations is higher, but due to not all data seems liable some meteorological station data were excluded from the analysis.

Result: climateCam.xls (Excel table of average annual rainfall and temperature).

Step 2 Meteorological stations were transferred from longitude/latitude to UTM (X,Y) Indian Thailand. Station names and positions (x,y) on the map were checked with Province/District/Village position datasets from the Gazetteer (DoG). Names were changed to the Gazetteer system when appropriate. The periods of dry months and years were calculated a data set in Appendix ii.

Result: climateCam.dbf and ArcView shapefile.

Step 3 Rainfall data was interpolated by using the inverse distance weighting (IDW) method, and corrections were made for coastal, mountainous areas. The watershed boundary of the coastal zone was selected as the rainfall barrier, based on the assumption that rain measured in this region does not cross the Cardamom mountain range.

Result: Rainfall shown as a spatial pattern (grid).

Step 4 The final rainfall map was produced by smoothing; the interval lines were drawn by on-screen digitalizing (200mm and 600 mm classes). Stations with higher annual rainfall have higher weighting factors. A minimum of 20 years of data collection is generally considered necessary for statistical spatial analysis.

Result: Two maps: "200 mm rain" and "600 mm rain" interval as a shape.

B. Dry Period Map

Steps 5 and 6 Dry periods (<40mm/month) were determined by using climatic data from Appendix ii. These data were interpolated by using ArcView Spline, the best method for gently varying surfaces such as elevation. Interval lines were smoothed by on-screen digitalising to produce the map.

Result: Dry period map.

C. Average Temperature of Coldest Month Map

Step 7 The ArcView Spline method was used to interpolate climate data. In this step, Cambodia is viewed as a flat surface, and the height was corrected in Step 9.

Step 8 DTM height map (grid 250 meter) was used to show a 0.6 degree temperature decrease for every 100 metres in elevation (0-100=0, 100-200=0.6 etc).

Result: Temperature maps were corrected with elevation.

Step 9 Map interpolated in step 7 subtracted from map from step 8:

Result: Average annual temperature of the coldest month corrected for height.

Step 10 and 11 The grid map was reclassified as 0 : < 16.5 and 1 : > 16.5 (degrees Celcius) and saved as shape.

Result: Final temperature map of the coldest month for the two classes.

D. Geology Map

Step 12 The Geology map (1997) was reclassified to display the distribution of basalt, sand-siltstone, alluvium (old-recent), Gneisses-schists and complex mixture. Reclassification was necessary to simplify the data into 5 classes for the final model.

Result: Cambodia was reclassified into 5 geology types; on-screen digitalizing was used to smooth the lines and group into larger geology types.

E. Soil Map

Step 13 Complex soil types were reclassified to indicate low, medium and high levels of productivity. Conversion ratios are listed in Appendix iv.

Result: Map showing potential soil classifications.

F. Forest/Land Cover Map

Steps 14 and 15 Forest and land cover map (1997) was reclassified to include agricultural zones, shrublands, deciduous forest, evergreen forest, and mangrove/inundated. See Appendix v for conversion ratio. Reclassification was necessary to simplify the data into 5 classes for the final model.

Result: Cambodia reclassified into 5 land cover types, on-screen digitalizing was used to smooth the lines and group into larger land cover types.

G. Final Gene-Ecological Map

Steps 16 and 17 Maps were converted to shape maps and then combined into a single map. The union option was used to maintain all features/boundaries. Tabular data was cleaned.

Result: Final map including all criteria for gene-ecological zones