

Application GIS on environmental zoning and management

(Case study in Sontay, Hanoi, Vietnam)

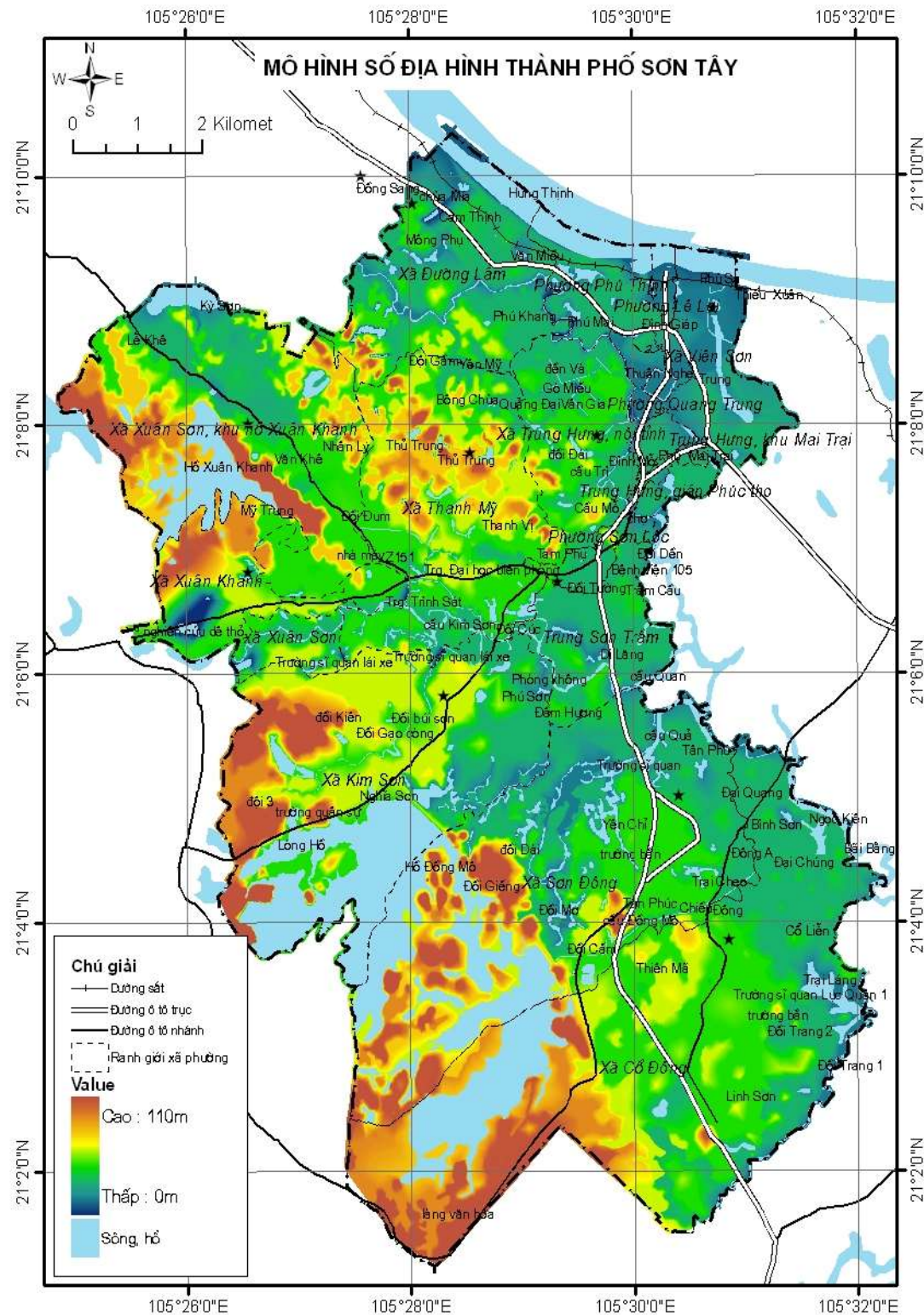
**Hien LE thi thu, Vietnam
Institute of Geography, VAST**

Objectives

- Survey environmental conditions in the study area
- Establish GIS database for environmental zone (EZ)
- Defined and zoning EZs

The study area (Sontay town)

- Sontay is a small town, and It so close to Hanoi
- Its has total 12,000 ha. But the trend of the economic development is concentrated on expand urban settlement, develop industrial and tourism activites
- So, EZ for protecting environmental quality and proposal a rational land use that are require from Sontay Government



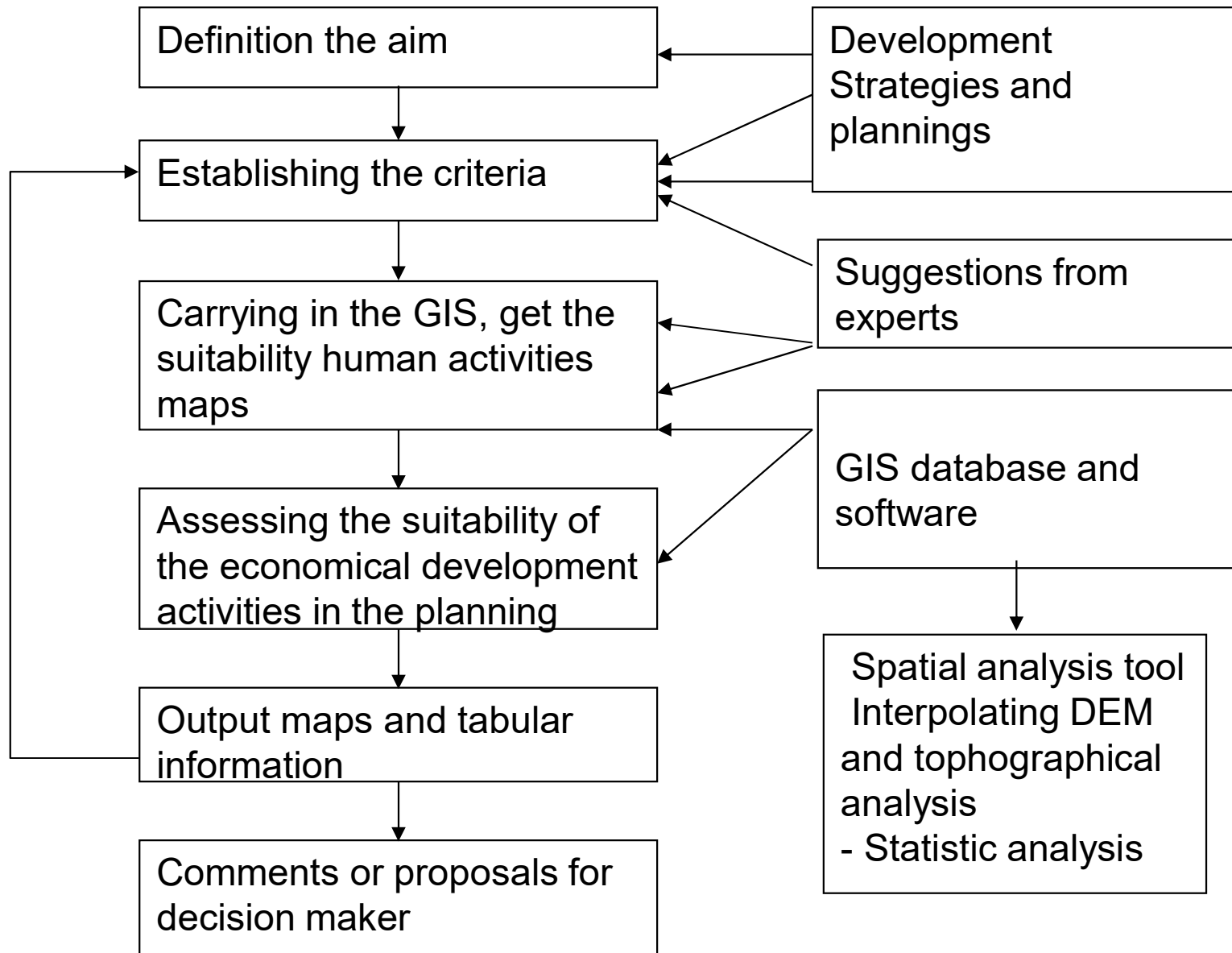
Methodology and Methods

- Ecological approach
- Suitable analysis
- Using GIS tool: GIS database, and multi-criteria analysis; spatial analysis
- Following 10 Criterias of EZ

Criteria were collected for suitable assessing

	Urban settlement	Build up area for industry	Tourism development	Agriculture
Topography (elevation, slop, and direction)	X	X	X	x
Geology and geomorphology (stratum, foundation stone, risks, faults, vulnerability, etc.)	X	X	X	
Hydrologic-al system (density, lakes and distance)	X	X	x	X
Soil (type, quality, erosion)	X	X		X
Land use and land cover	X	X		X
Environmental qualities	X	X	x	X
Infrastruct-ure (road, hotel, restaurant, hospital, etc.	X	X	X	X
Cultural condition (pagoda, festivals, vestiges, etc.	x	x	X	x

Multi-criteria and spatial analysis



GIS database and spatial analysis

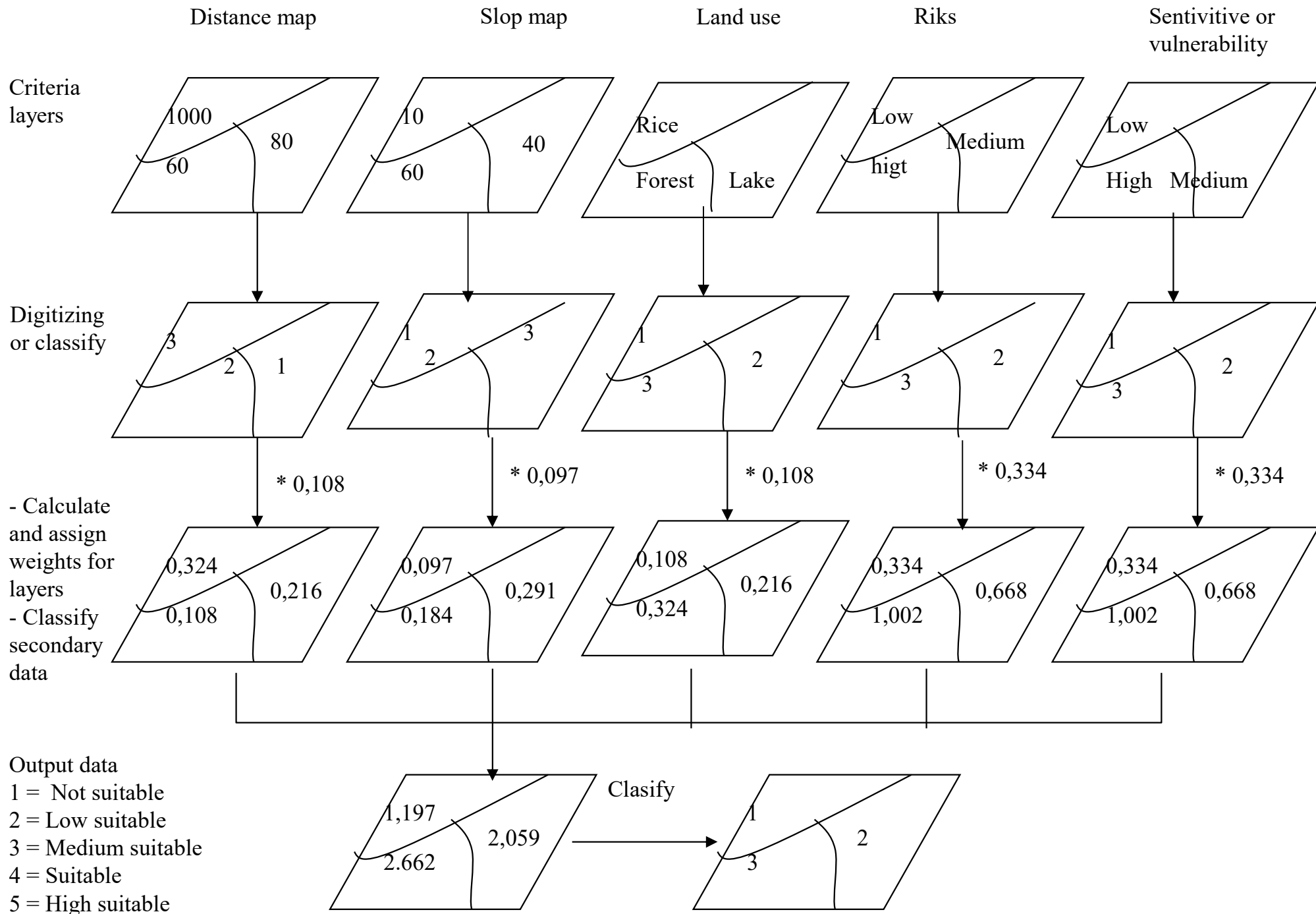
GIS database

- Natural data
- Socio-economical data
- Environmental quality
- Trend of economical development
- Suitable maps

Spatial analysis

- Spatial analysis tool in ArcGIS
- Interpolating DEM and topographical analysis
- Statistic analysis

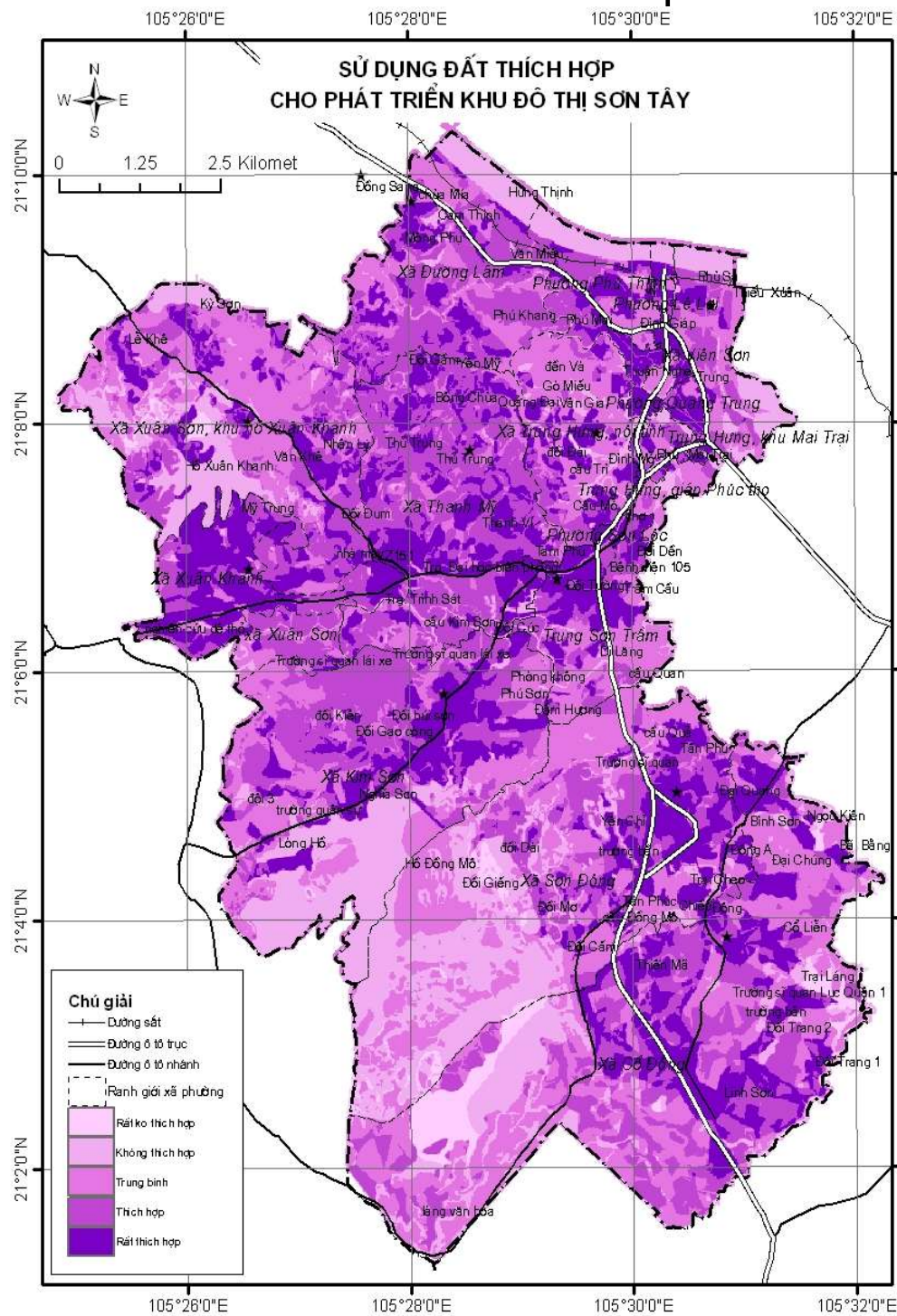
Example suitable assessing in the GIS software



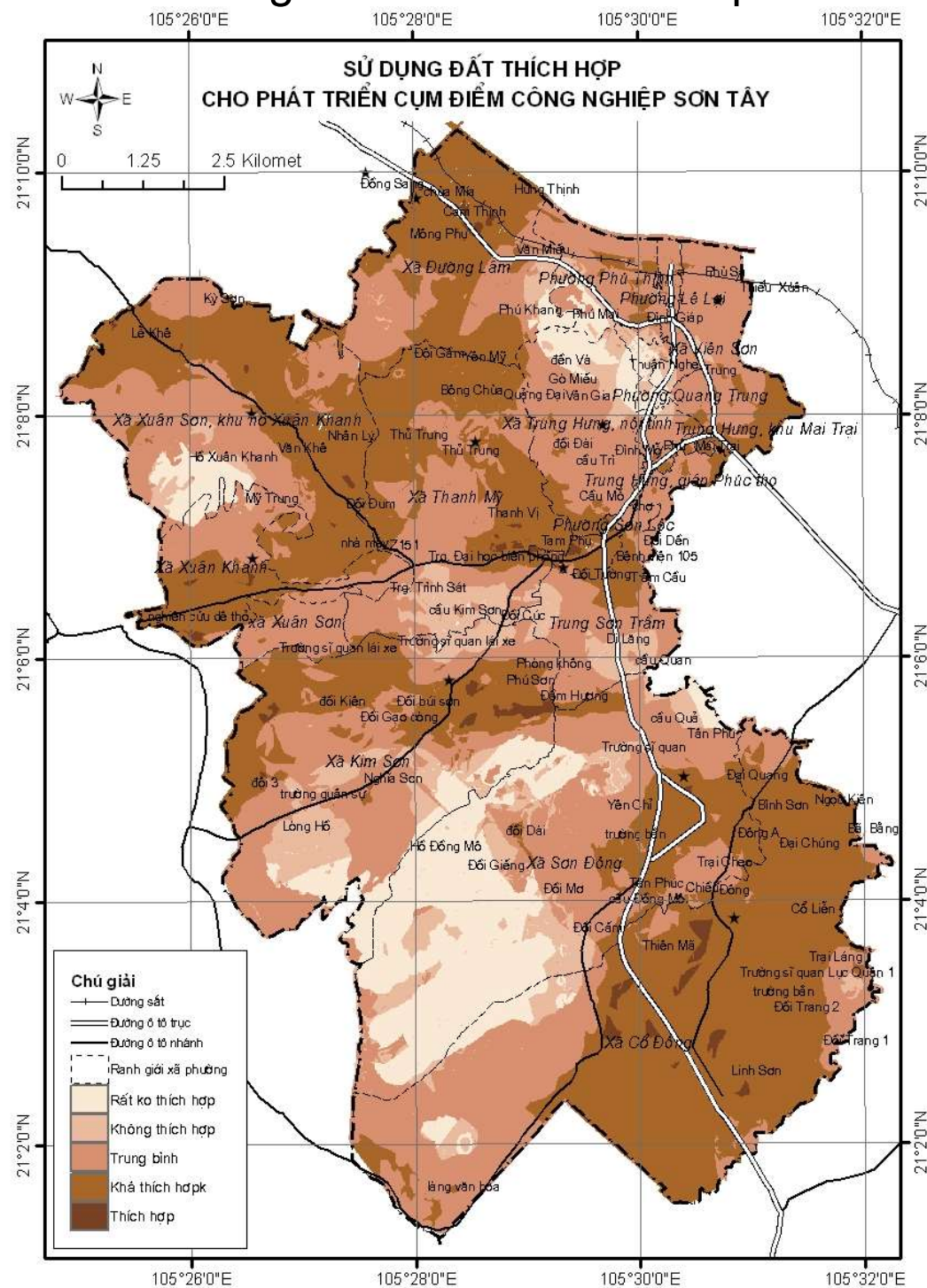
Output

- **Suitable maps**
- **Environmental zones map**
- **and proposal environmental management plants in the each environmental zones**

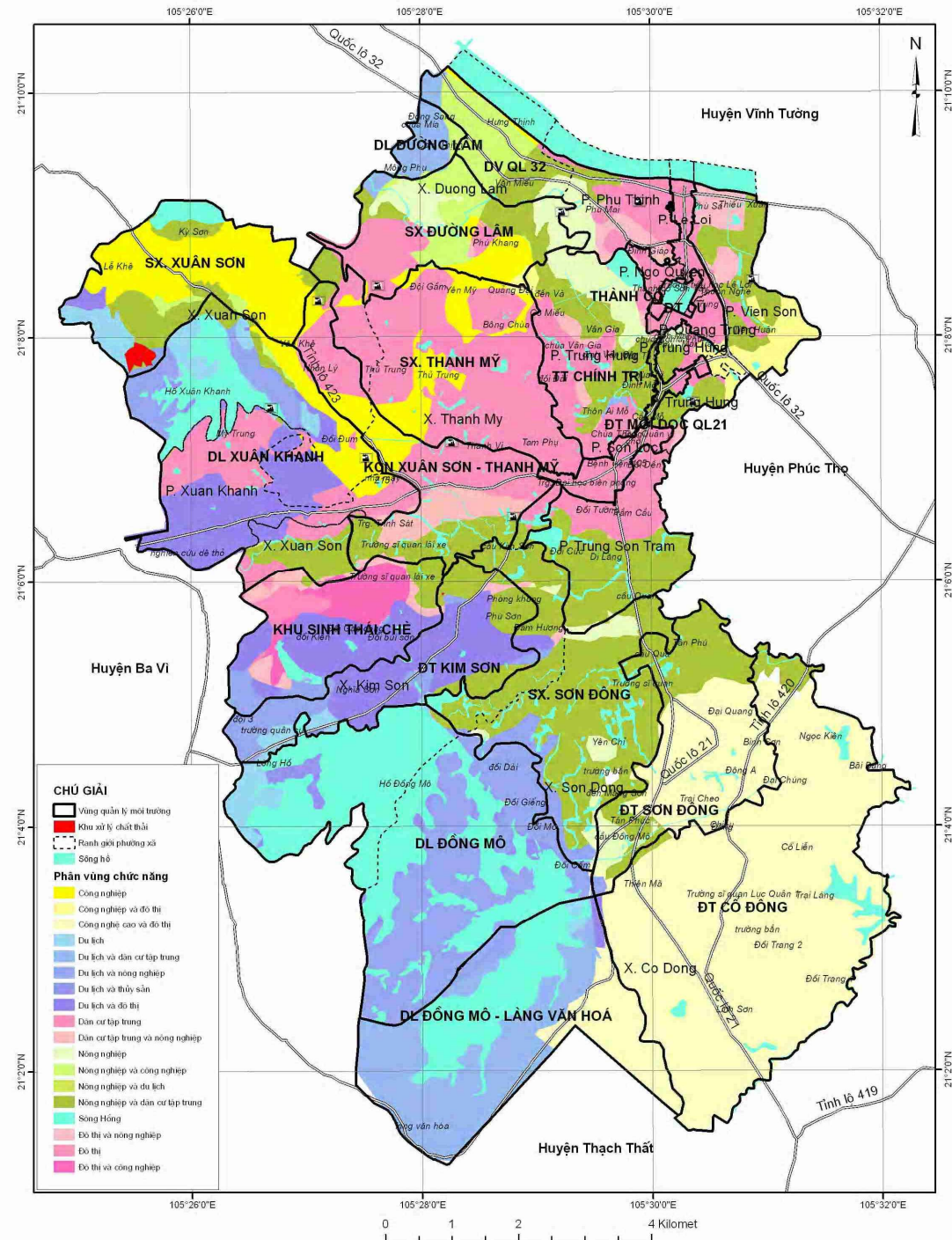
Tourism Suitable map



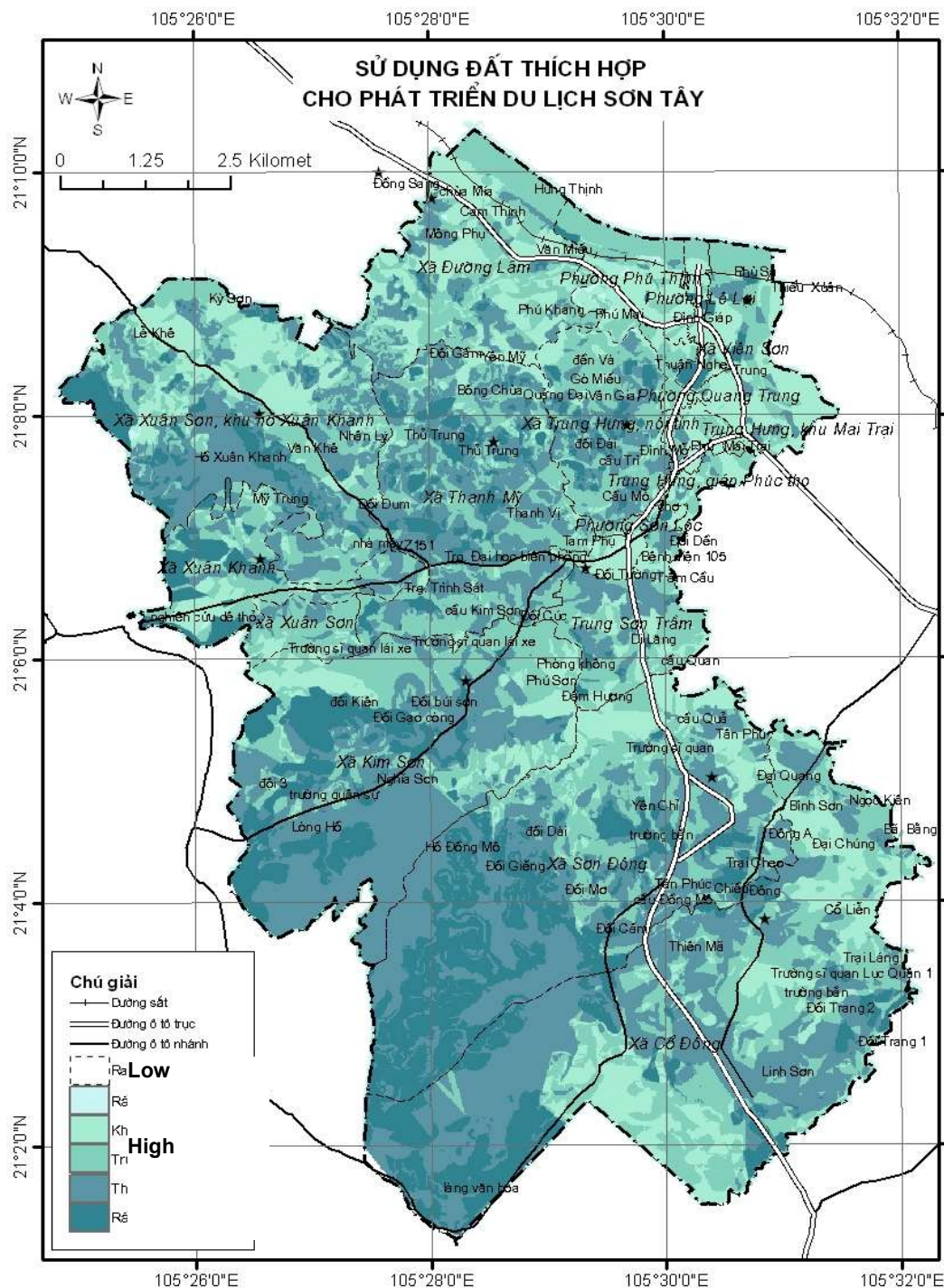
Agricultural Suitable map



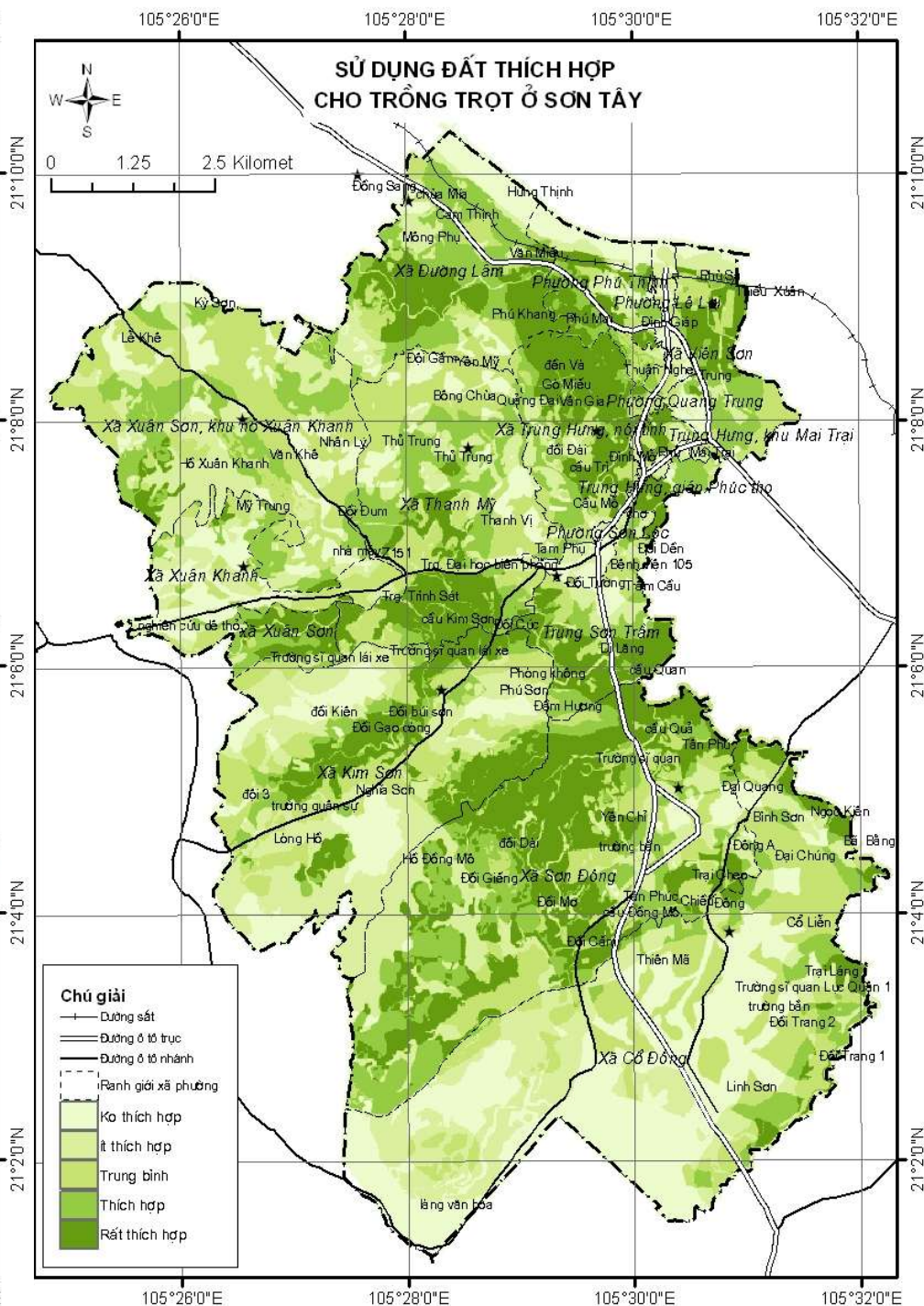
- Urban and cultural tourism development zone
- Eco-tourism and breeding development zone
- Industrial and planting vegetation and flower development zone
- Rural intermix industrial area



Tourism Suitable map



Agricultural Suitable map



CONCLUSION AND RECOMENDATION

- The ecological approach and suitable analysis are rational methodology and method for EZ
- GIS database need to describe enough information of the study area
- Collected Criterias is the most importance in the suitable analysis processing and zoning EZs
- Sontay can be divided into 4 EZs. And . The solutions of the environmental management can be built based on their characteristics.