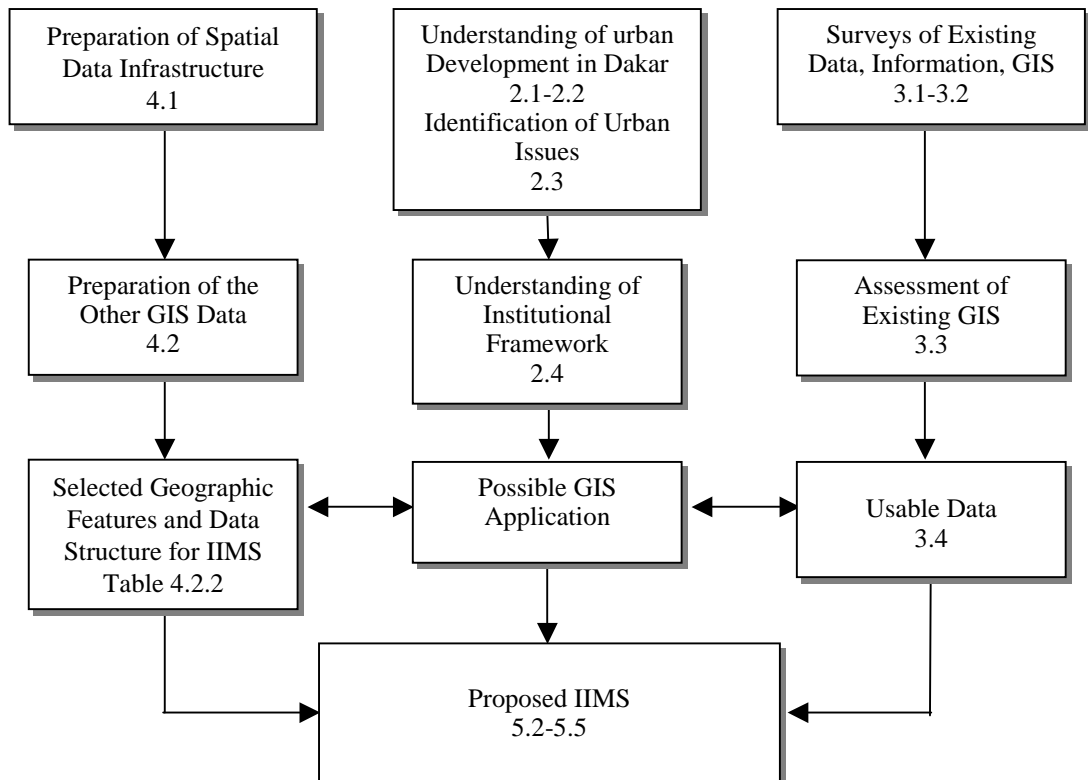


# 5 INFRASTRUCTURE INFORMATION MANAGEMENT SYSTEM

## 5.1 Concept of IIMS

The basic policy in planning the proposed IIMS is that the Senegalese agencies can immediately use it for practical work while learning from the process. Also, the ability of DTGC and DUA at present and in the near future has been taken into consideration, in addition to the availability of usable data. Figure 5.1 indicates the procedure of IIMS concept formation.

**Figure 5.1 Formation of IIMS Concept**



Note: Numbers in each box correspond to the sections or tables of the main report.

Source: JICA Study Team

## 5.2 Selected Sub-Systems and their Roles

The following four sub-systems have been formulated for the initial IIMS to satisfy the requirements arising from the urban issues and institutional framework of Dakar.

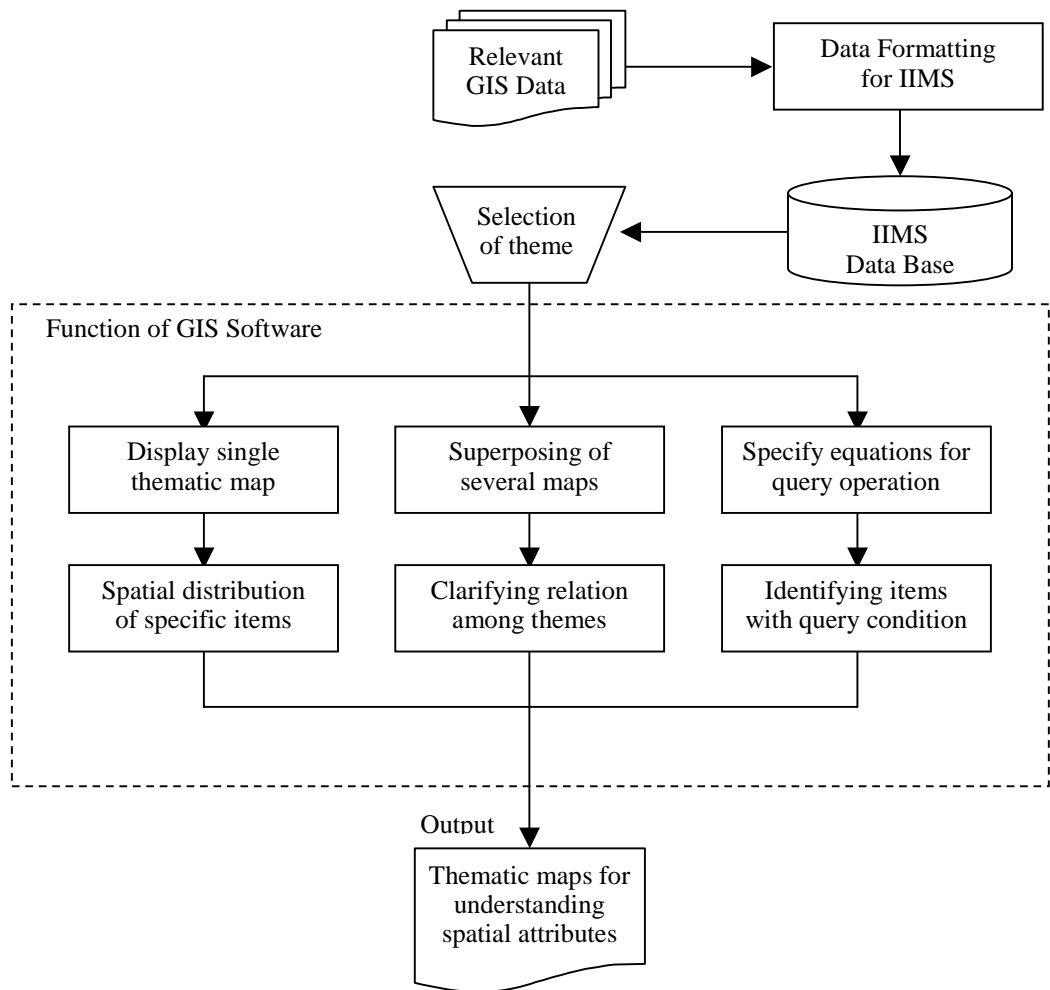
- 1 Sector Information Reference Sub-System;
- 2 Urban Development Control Sub-System;
- 3 Urban Planning Support Sub-System; and
- 4 Residential Site Evaluation Sub-System.

These sub-systems were specifically chosen to demonstrate how the IIMS can be applied to cases with different objectives in urban planning and management in Dakar. It is hoped that the breadth of sub-systems presented here would facilitate the expansion of the IIMS in other applications.

### **5.3 Urban Sector Information Reference Sub-System**

The Urban Sector Information Reference Sub-System achieves its objectives by identifying and locating government and public facilities, services, and infrastructure; identifying existing land uses and zoning regulations; providing demographic data such as population distribution and density, and analyzing relationships among them. Figure 5.2 illustrates the structure of this system. Various thematic maps and their attributes in this system can be directly applied to the analytic work presented in urban carte form.

**Figure 5.2 System Design of Sector Information Reference Sub-System**



Source: JICA Study Team

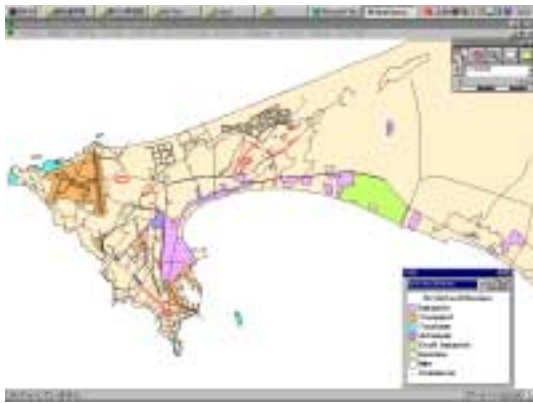
**Figure 5.2-B Output Examples of Sector Information Reference Sub-System**



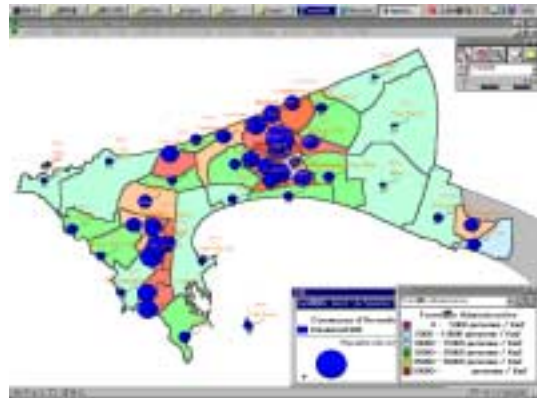
Location of Public Facilities



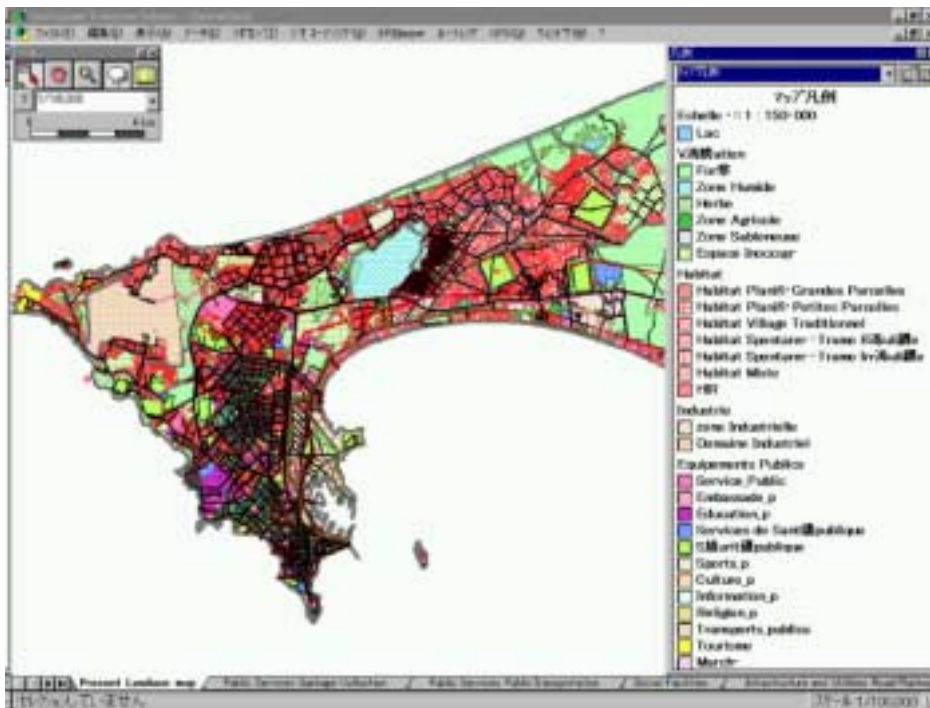
Utilities-Water Supply



Zoning/Evolution of urbanization



Population and its density

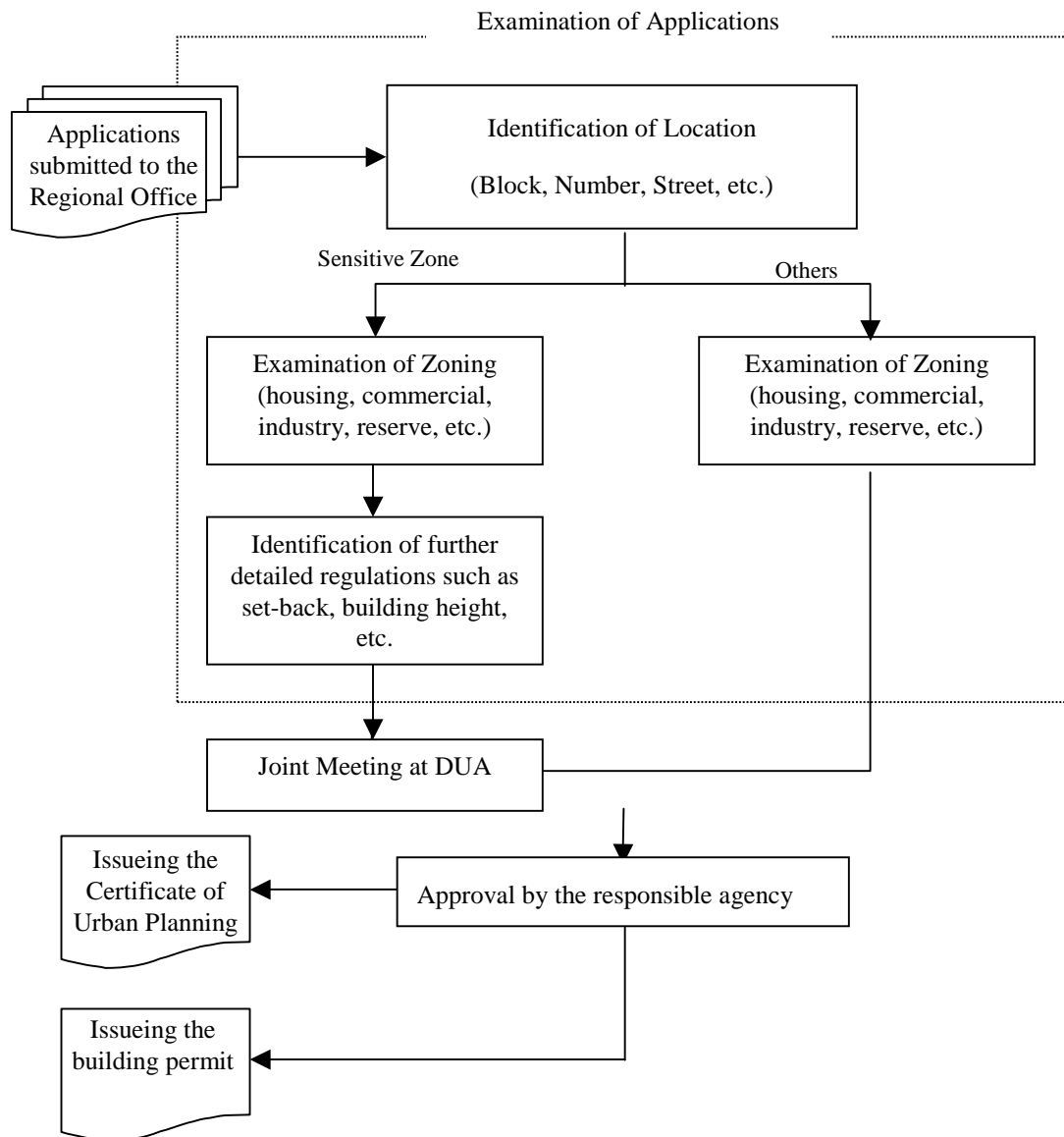


Present land use

### 5.4 Urban Development Control Sub-System

This sub-system will assist in the examination and issuance of applications for urban planning certificates and building permits. Figure 5.3 shows the structure of this sub-system. The initial system includes only the Dakar Plateau area and Almadies, however it is also clear that the system will help DUA to formulate future urban development policy options by its accumulated records of urban development.

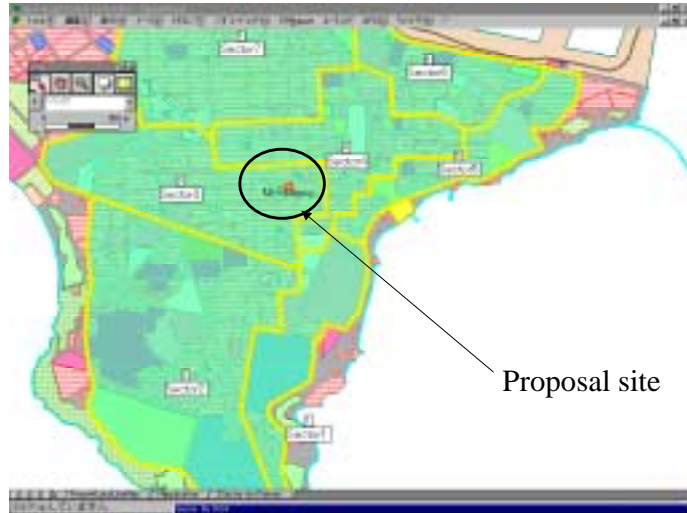
**Figure 5.3 System Design of Urban Development Control Sub-System**



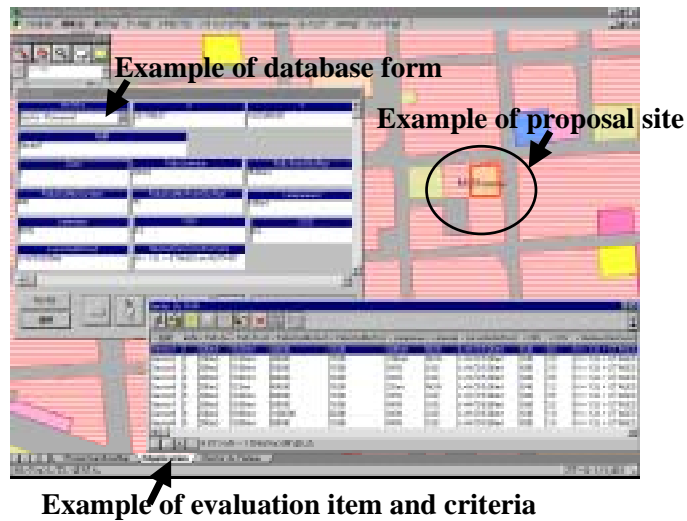
Source: DUA, JICA Study Team

### Figure 5.3-B Sample Display of Urban Development Control Sub-System

Sector map for building permission control in Dakar plateau



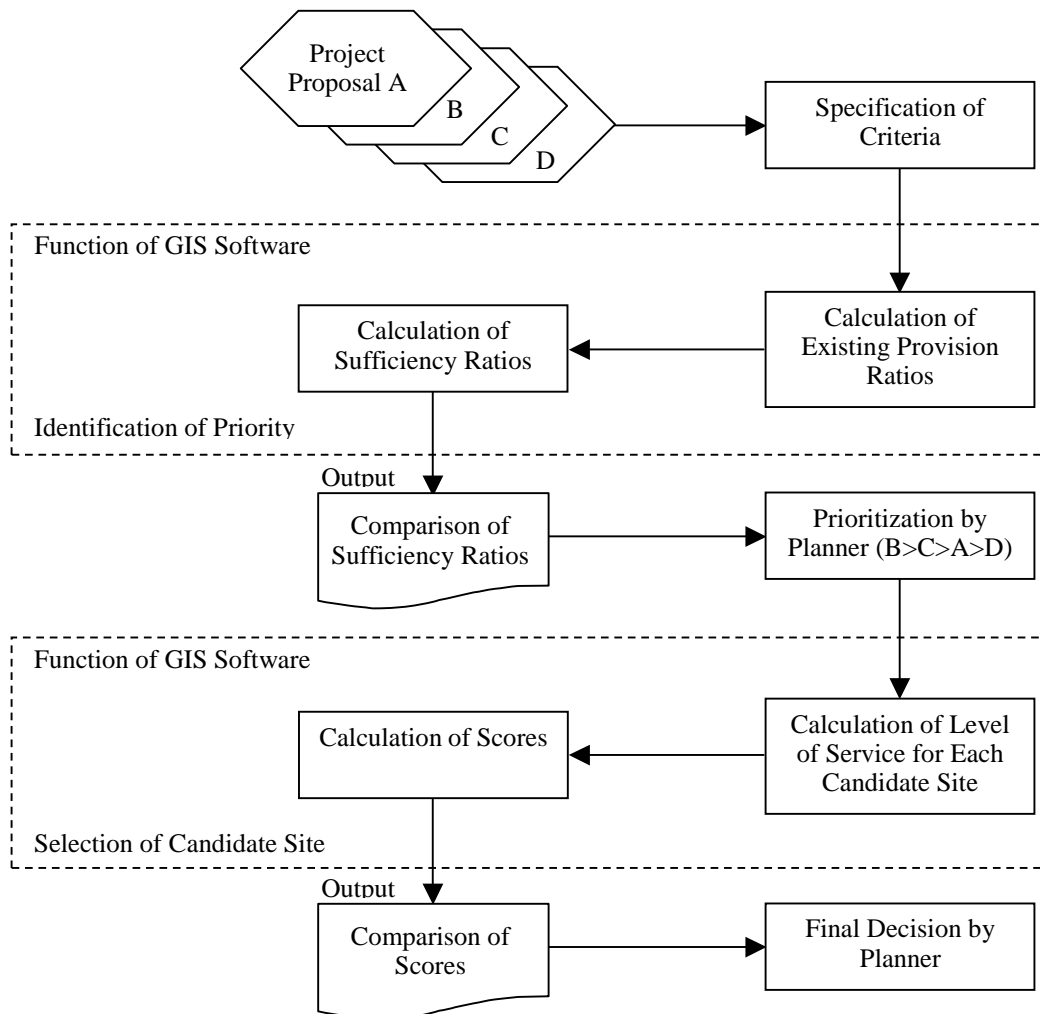
Example of evaluation form and criteria for building permission control



### 5.5 Urban Planning Support Sub-System

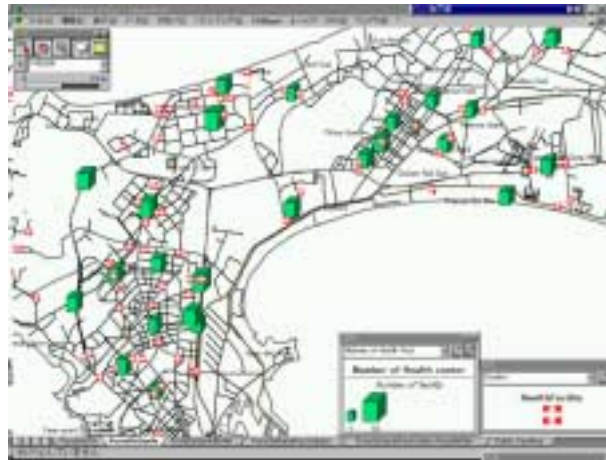
The Urban Planning Support sub-system will help planners identify areas lacking public facilities. Once the need for a new facility has been identified, this sub-system will give planners a tool for evaluating and comparing possible sites for the new facility. Figure 5.4 indicates the structure of this sub-system.

**Figure 5.4 Structural Design of Urban Planning Support Sub-System**

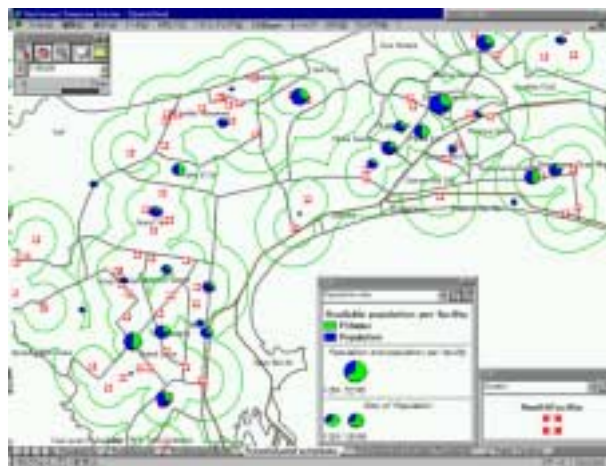


Source: JICA Study Team

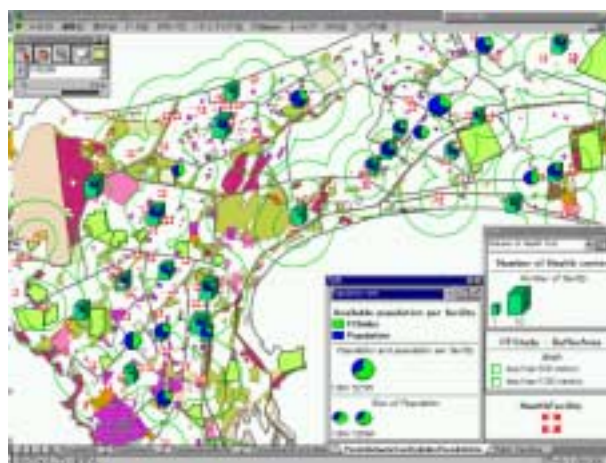
Figure 5.4-B Output Example of Urban Planning Support Sub-System



Number of health posts in each ward



Sufficiency of public facilities



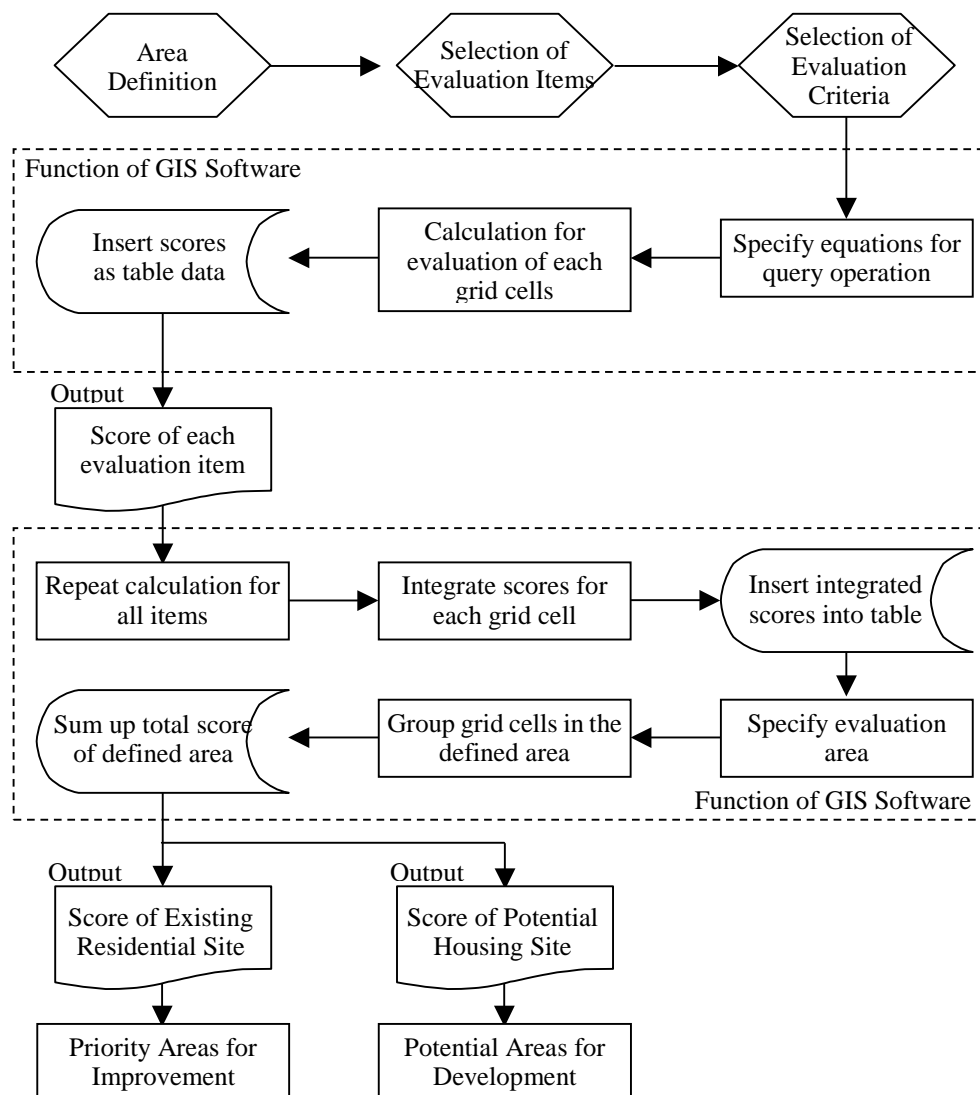
Site selection of public facilities



## 5.6 Residential Site Evaluation Sub-System

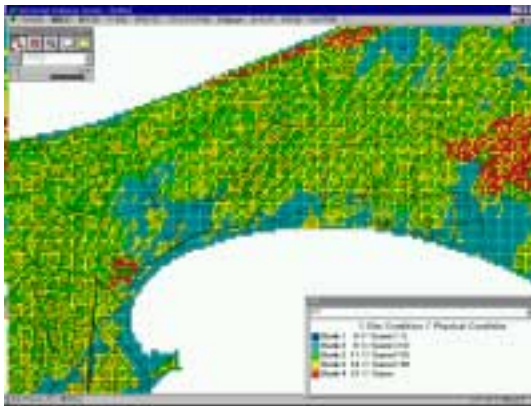
This sub-system assists planners to synthetically evaluate how adequate a specific area is for residential purpose by a series of quantitative assessments against various criteria and comparison of results from other areas. Each criterion for this evaluation is weighted according to the priority as the conditions of residential area. The total scores of the areas can be compared. Combination of criteria and their weighting can be changed to meet the needs. The structure of this sub-system is shown in Figure 5.5, and examples of evaluation criteria are given in Table 5.1.

Figure 5.5 Structural Design of Residential Site Evaluation Sub-System



Source: JICA Study Team

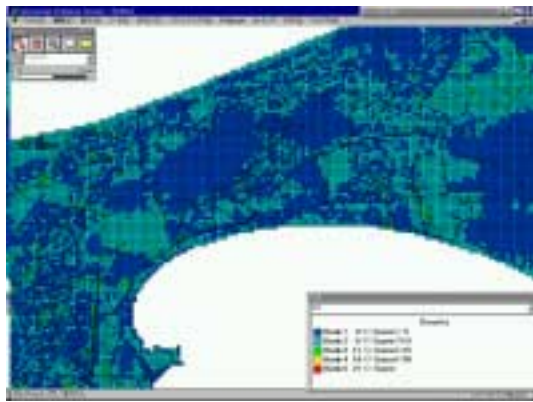
**Figure 5.5-B Output Example of Residential Site Evaluation Sub-System**



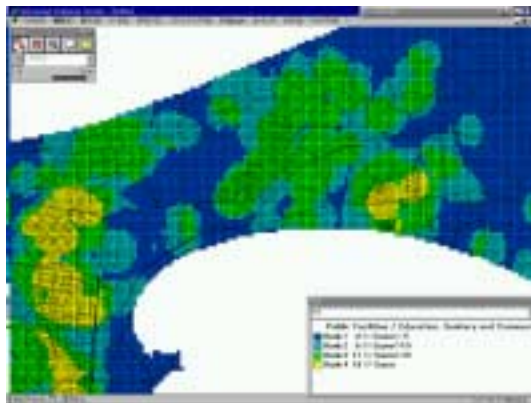
Grid analysis of physical condition



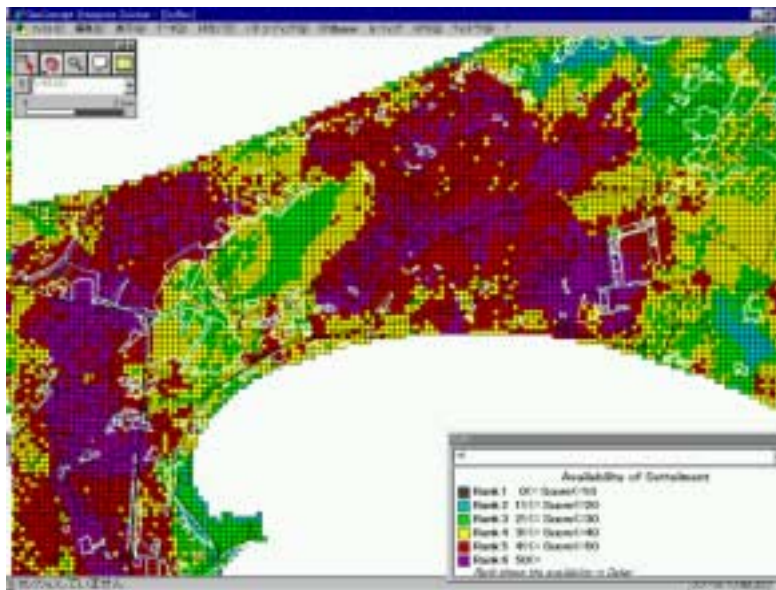
Grid analysis of utility sufficiency



Grid analysis of housing density



Grid analysis of public facility sufficiency



Evaluation of residential sites

**Table 5.1 Evaluation Criteria for Residential Site (an Example)**

Evaluation Items		Criteria or Norms	Score*		
Category 1	Category 2	Category 3			
Site Condition (30 points)	Physical Condition (24 points)	Land slope	less than 3 %	2	
		Altitude	more than 5 m	6	
		Depression	No	4	
	Social Condition (6 points)		Reserves	No	6
			Water surface	No	4
			Farm land	No	2
			Distance to work place	less than 20 km	4
Density (25 points)		Land price	less than average	2	
		Population	less than 500 persons/ha	5	
		Parcel (built-up) ratio	less than 70 %	5	
		Road ratio	more than 20 %	5	
		Park and open space ratio	more than 5 %	5	
Public Facilities (25 points)	Education	Houses	less than 35 houses/ha	5	
		Primary schools	within 500 m	5	
	Sanitary	Secondary schools	within 2 km	5	
		Community health centers	within 500 m	5	
		Hospitals	within 2 km	5	
Commercial	Markets	within 1 km	5		
Public Services (10 points)	Garbage collection Transports publics	Collection routes	within 100m	2	
		Public bus routes	within 200 m	2	
		Private bus routes	within 200 m	4	
		SNCFS	within 1 km	2	
Infrastructure (10 points)	Roads	Major roads	within 1 km	5	
	Water supply	Well or public taps	Yes	1	
		Individual distribution	Yes	1	
	Sewage	Drainage	Yes	1	
		Sewage	Yes	1	
	Electricity	Individual distribution	Yes	1	

Note: All the scores are tentative.

Source: DUA, JICA Study Team