Part 1 – Introduction

We have been utilizing Geographic Information System (GIS) in our work both in Japan and overseas. We have also run a series on GIS in the past (Vol. 1-6), however, in this new series, we would like to introduce new experiences we have had and what we have learnt from them, as well as offering our advice when using GIS.

GIS is a database which links map information and statistical data. It enables us to efficiently conduct geographic (spatial) analysis. For instance, we can comprehensively understand characteristics of an area through visual presentations based on various themes describing situations in the area. GIS also enables us to extract areas that fall under certain conditions, and by overlaying various information, we can obtain new understanding.

We have been using GIS as a tool, making the full use of its characteristics and abilities. With GIS we developed development potential maps and land use planning maps in order to assist zoning of areas for formulation of regional development plans. We also developed a natural resource management ledger linking landscape photos with the soil and water quality data of an area. The following table indicates the main examples of AAI's GIS use in the past.

Country	Project	Example of GIS Use
Zimbabwe	Agricultural Development Study	Zoning by overlaying soil, vegetation, topography and other data.
Pakistan	Barrage Irrigation System Rehabilitation Study	Development of a land use map using remote sensing
Tanzania	National Irrigation Master Plan Study	Development of an irrigation potential map overlaying water resources, soil and socioeconomic data
Oman	Mangrove Resource Management Study	Development of a Data Base system linking remote sensing images of the mangrove sites, and results of site survey and monitoring
Syria	Development Project of Efficient Irrigation Techniques and Extension	Identifying priority project sites based on data such as irrigation area and ground water level

Danger of over-reliance on maps

As stated, GIS is a highly useful tool. However, as it can create very good looking maps, there is the potential for the results of a particular analysis to get out of hand. For example, although boundaries created through GIS analysis can be changed as a result of revision of criteria, data addition and updates, there is always a danger that people will see the GIS map as absolute and fixed. In addition, needless to say, the accuracy of data input in the GIS system is critical. If inaccurate information is used for analysis, wrong results can be generated. This threat is even greater in developing countries where it is difficult to obtain accurate and complete data. This also means that if one can obtain a large amount of accurate information it is possible to generate accurate and beneficial analysis. It is important to recognize that steady and accurate data collection is essential, a fact that tends to be overshadowed by the apparently showy maps GIS can produce.

Don't rely on operators – keep the distance between data collectors and map creators short

One of the problems people face in using GIS is that there is far too much distance between those who collect data and those who operate computer for the analysis collecting data. This problem is not unique to the GIS system but is also applicable to computer use for database management. For instance, in using the GIS system, the ideal scenario is that the same person collects, inputs and analyses data, and checks how the analysis is expressed on maps. In this way, eagerness for data collection increases, naturally leading to the higher accuracy of the collected data. However the real situation is that there is normally a GIS expert specializing in operating GIS software due to a clear division of work existing in many institutions. The specialized nature of GIS operators is exacerbated because of the development of increasingly technical GIS software and the high price of such software. It may not be realistic to hope that everybody should be able to operate modern GIS software which can perform multifunctional and high level analysis. Nonetheless, it is an important asset when using GIS not to completely rely on GIS operators. It is recommended that those who collect data in the field utilize GIS for some less complicated analysis. This should also lead to finding new effective ways for data use.

Data sharing

Another problem is that one cannot share data, even if a magnificent data system is created with GIS, unless counterparts or counterpart institutions possess the same software. One way of overcoming this barrier is to publish GIS data on the Internet so that a larger number of people can use the database.