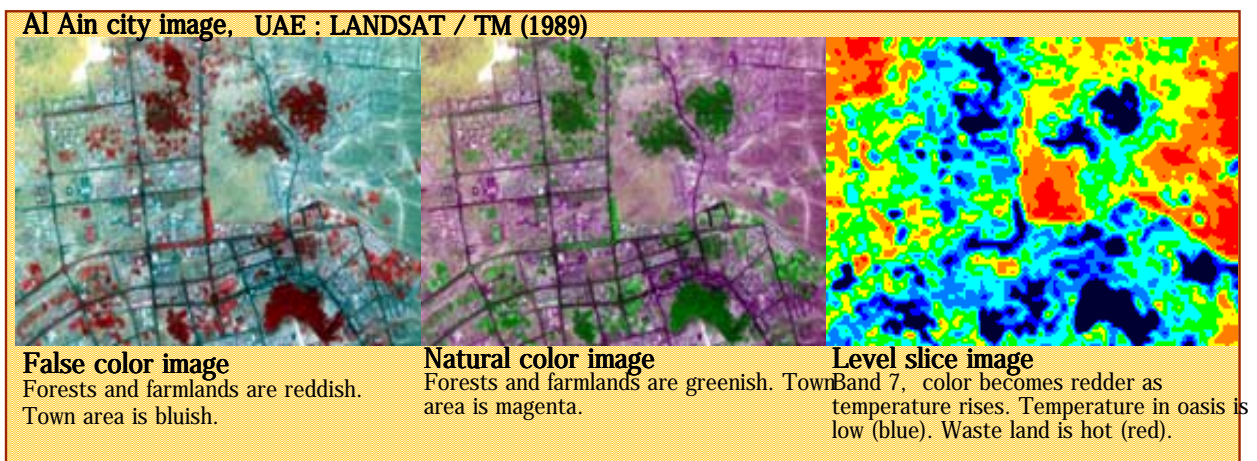## You can do it!　Remote Sensing Analysis

Part 3: Image processing techniques commonly used for analysis

The satellite image contains not only visual data (natural image) but also arranged numerical data. We can utilize the numerical data to process an image according to the purpose. It is called Image Processing. There are three kinds of image processing as follows; Retouching Processing which takes away distortion caused by atmospherical condition or position of a satellite, Conversion Processing which makes it easy to visually recognize the contents of an image, and Classification Processing which classifies objectives in an image according to purpose.

> False color image :
>   near infrared + red + green (R+G+B)
> Natural color image :
>   near infrared + red + green (G+R+B)
> Pseudo color image :
>   Shade of a color is assigned according to the rank of objectives.

(1) Output of image

You can make an image by assigning colors to the information of each band from satellite data. False color image, natural color image and pseudo color image are commonly used.

Al Ain city image,　UAE : LANDSAT / TM (1989)

False color image
Forests and farmlands are reddish. Town area is bluish.

Natural color image
Forests and farmlands are greenish. Town area is magenta.

Level slice image
Band 7, color becomes redder as temperature rises. Temperature in oasis is low (blue). Waste land is hot (red).

(2) Bi-Band Analysis

NDVI (Normalized Difference Vegetation Index) is a kind of Bi-Band analysis which is used to identify the area where vegetation shows strong vitality. In the case of TM(thematic mapper), NDVI is calculated by Band 3 and Band 4, which formula is

NDVI=(Band4-Band3)/(Band4+Band3).

Land Use Classification (SPOT Image)
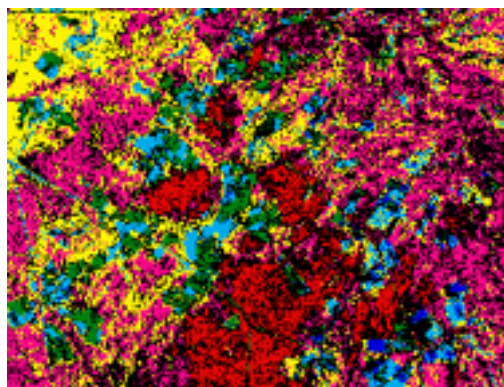
- farmland
- pasture
- fallow land
- thin wood
- forest area
- no classification

(3) Maximum Likelihood Method

Maximum likelihood method is the most popular method which sorts a pixel in accordance with maximum likelihood of classified sample data (ground data at the spot) under the assumption that the classified sample data shows normal distribution.