Our Newsletter "AAINews" to You

It is our pleasure to present here the first issue of our newsletter "AAINews" to you. AAI (Appropriate Agriculture International Co., Ltd.) was established in 1984, and since then we have devoted ourselves to research and development of appropriate agricultural technology which is applicable to arid and semi-arid lands.
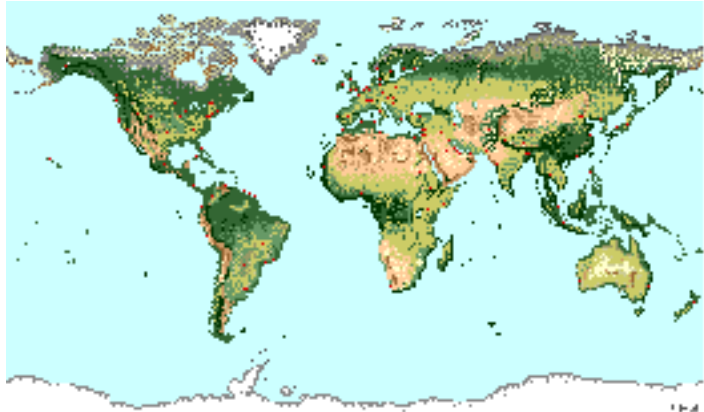
We have long working experience in agricultural technical cooperation in Middle East (UAE, Syria and Oman), Africa (Senegal, Kenya and Zimbabwe) and Asia (Pakistan) through official development aid by the Government of Japan as JICA's short and long term experts on arid land agriculture, prevention of desertification, afforestation and on agricultural extension. One staff has been working in Oman for fodder cultivation as JICA's long term expert as well. Through these activities, we are getting precious information about culture, life style, and other specific knowledge on environmental issues such as desert afforestation, halophyte, xerophyte, appropriate technology, environmental conservation and sustainable agricultural development, in arid lands.

We believe that those information are not only interesting but also very useful, therefore we would like to share them through our AAINews with those who are interested in.   AAINews will be issued bimonthly. Your comments and suggestion on our articles will be highly appreciated.

What is AAIN

AAIN is the combination of first letters of our company name "Appropriate Agriculture International" and "Newsletter", also, there is another meaning in it. That is the name of a city "Al AIN", an oasis city in UAE where we AAI have been deeply related to.   AIN means "fountain" or "eyes" in Arabic and it brings up the image of oasis, where people gather to rest and have precious water in arid land.

A view of Al Ain city

Cultivation in Oasis

PART 1 : Large scale afforestation and urban greening

(1) Purpose of afforestation
Based on the principle of the President Sheikh Zayed that "Profit gained by petroleum from the ground has to be returned to the soil", a part of the profit gained by selling petroleum is allocated to expand afforestation area.   Projects can be classified into two kinds according to the purpose.

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Large scale afforestation ;	Tree planting to protect roads or farms from wind and shifting sand.
Urban greening ;	Tree planting to improve living environment. Target spots are median strips of main roads, parks, road sides and public sectors.

Large scale afforestation projects have been carried out mostly in Abu Dhabi emirate and recently some projects have also being implemented in Dubai emirate.   However, no large scale projects have been conducted in the northern emirates because there is no agency for large scale afforestation in the Ministry of Agriculture and Fisheries which is in charge of the area. On the other hand, except for Abu Dhabi emirate, every emirate has gardening section and they have been operating greening projects in urban area of each emirate.

Large Scale AfforestationUrban Greening (Al Ain City)

(2) Present Achievement

In Abu Dhabi, a French consultant company initiated afforestation in 1969, for about 245ha along the Al Ain-Abu Dhabi road. After that, afforestation area has been expanded dramatically. In eastern region of Abu Dhabi, 29,200ha had been planted with trees by 1992.   In western region, afforestation area was about 4,000ha in 1980.   Due to active tree planting, 26,500ha, mainly in and around Liwa oasis and along main roads, had been completed by 1992.   And it is said that in Dubai emirate, which recently started afforestation projects, around 3,000ha has been completed already.
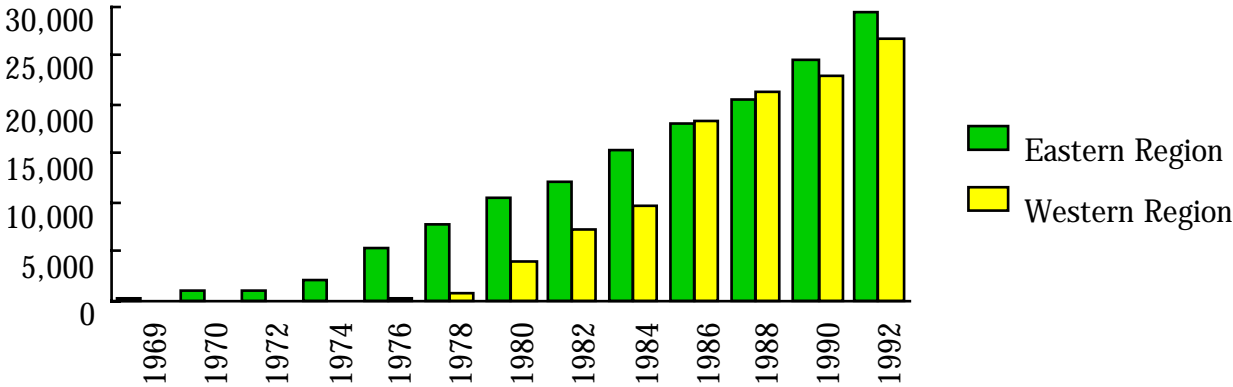
**PART l : How Easy to start Remote Sensing Analysis**

(1) What is remote sensing analysis

Remote sensing is a technology to observe wide range of the earth under the same condition by a sensor of electromagnetic wave on satellites or air planes.   By collecting ground information (crops, vegetation, soil, or temperature) on the spot and by analyzing the relation of the remote sensing data and measured reflectance, it is possible to estimate accurately the situation of an area where it is difficult to conduct direct field survey such as jungles, deserts, mountains, etc.   Nowadays, remote sensing analysis is used in various fields; meteorology, geology, environmental research, and so on.

Then, what is the theory of remote sensing technology?   Light radiated from the sun reaches materials on the earth and reflects. Simultaneously, materials on the earth radiate various electromagnetic waves including infrared rays. These electromagnetic waves are caught by sensors, and features of materials are analyzed from disposition and strength of the waves.

Research fields of remote sensing analysis :

Agriculture: Crop yield estimation, Cultivated area,
                   Soil classification
Forestry: Classification of vegetation,
                   Observation of fire, Control of disease
                   and vermin
Land: Present land use
Disaster: Observion of volcano, Landslide survey
Geology: Land surface survey, Structure Pattern of
                      land, Geo-thermal survey
Water: Snowing survey, Survey of surface water
Environment: Environmental classification,
                   Environmental pollution, Observation
                   of urban environment
Ocean: Distribution of water temperature, Current
                   survey, Red tide survey
Weather: Meteorological survey and forecast

TM image and field view of Al Ain area, UAE.
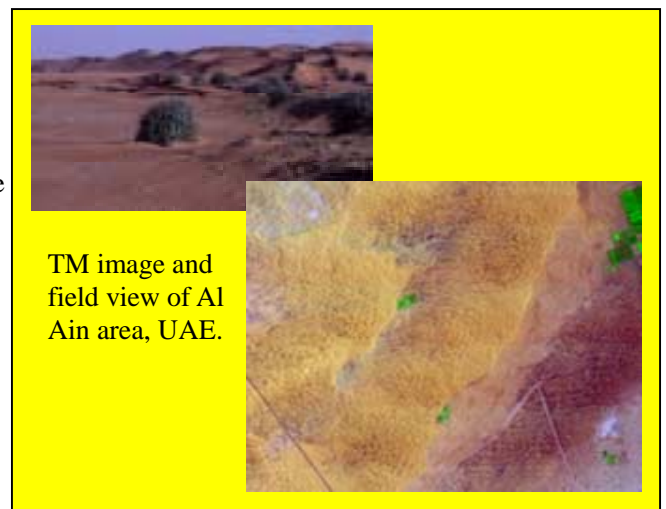
(2) Isn't it costly ?

Everybody usually thinks that remote sensing analysis is costly because it requires expensive equipments and special soft ware for image analysis. However, it is possible to make the system cheaper than it is imagined. Our system uses less expensive equipment mentioned below;

Computer: Macintosh LC630 (around US$ 1,200)
Soft Ware: Photoshop,   MapII, others (provided by prof.Tsuchiya, Shizuoka University)

(3) Where can you get remote sensing data ?

You can buy satellite data, such as LANDSAT (TM, MSS), SPOT, JERS-1, and MOS-1 at RESTEC (Remote Sensing Technical Center) in Japan.   They sell image data and numerical data in magnetic disks, tapes and CD-ROMs. Regions covered by each satellite are as follows;

Satelite	Data covered
LANDSAT (TM, MSS):	All over the world
SPOT:	All over the world
JERS-l:	Far East, South East Asia, Australia, Europe, North America
MOS-l:	Far East, South East Asia, Europe, North America

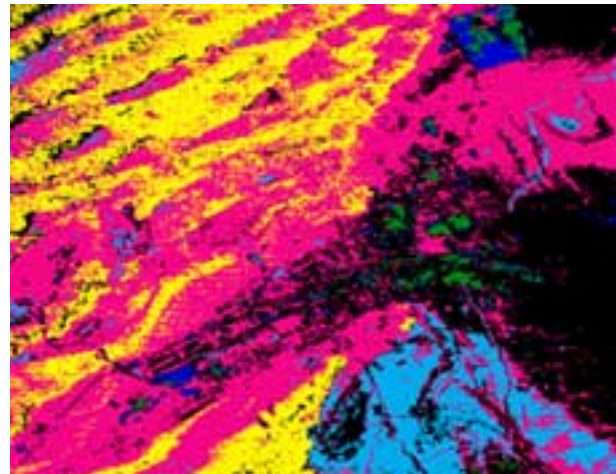## Plants in Arid Lands and Their Utilization

PART 1 : Introduction

In recent years, desertification and soil erosion caused by deforestation and land degradation are becoming very serious problems, especially in arid and semi-arid regions. International organizations and local governments have been conducting many kinds of projects to prevent environmental degradation.   And as one of them, afforestation in arid region is highly important and indispensable. Purposes of afforestation are as follows;

1) To increase crop production by protecting farms from wind/sand with forests,

2) To supply forestry products such as food, fire wood, charcoal and lumbers,

3) To feed livestock,

4) To preserve soil and water, and

5) To give opportunity for employment and to activate local economy.

There are various kind of growing forms of trees and kind of utilization of them, which depends on their species. Therefore, the characteristics of those plant species and natural habitats of a project site must be well grasped before an afforestation project is implemented.   In this series, we describe the relationship between typical landscape and natural vegetation in Al Ain, UAE, as an examples in arid lands.   Then we will introduce the characteristics of major species found in each landscape.   And finally, we will discuss a method of zoning for agriculture/afforestation development planning derived from the relationship between natural vegetation and their environmental factors (landscape, soil, underground water, etc.).

This is a Landsat satellite image of Al Ain analyzed by maximum likelihood method. Classification of the land is as follows;

- ▇ Farmland
- ▇ Sand dune
- ▇ Mountains
- ▇ Alluvial fans
- ▇ Lowland between dunes and others

In and around Al Ain area, general tendencies between landscape and vegetation are recognized as follows;

Landscape	Vegetation
1) Rocky mountains (without soil)	*Acacia tortilis*
2) Around wadi in mountains	*Zyziphus spina-christi*
3) Alluvial fan-1 (flood area)	Bare land
4) Alluvial fan-2 (marsh)	*Prosopis cineraria*, *Haloxylon salicornicum*
5) Alluvial fan-3 (others)	*A.tortilis*, *Rhazya stricta*, *H. salicornicum*
6) Dune -1 (boundary dune)	*Cypelus conglomeratus*
7) Dune -2 (dune)	*H. salicornicum*, *Panicum turgidum*
8) Wadi	*Calotropis procera*
9) Lowland between dunes	*Zygophylum hamience*

We will report about typical landscape and major vegetation of the area in coming issues.