

# Education and Capacity Building Of Space Technology in Iraq

**Presented by**

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# 1. Introduction

The use of space technology in Iraq was backdated for more than 30 years ago when the first receiving earth station had been established for satellite communications. Further more remote sensing activity had been created in previous *scientific research foundation* since 1980. Also the centre of space image processing is constructed in *general directorate for geology survey*. Some of research groups in universities have also contributed in space fields.

Iraq suffered many problems due to several wars and the UN sanction, as result of that the space activity received little attention. Therefore there was no strategic clear plan to activate this field for nation sustainable development.

After the last war (April 2003), the space technology has played an important role in the civilian life in Iraq. The mobile communication system and the Internet system have been increased and are widely used in large areas of Iraq.

## 2. Main Space Technology Applications

Space technologies are used and classified as follows:

1. Satellite communication.
2. Global positioning system (GPS).
3. Remote sensing activity.

The use of the above three technologies have presented good new solutions for previous problems because they are fast and have a relatively low cost.

### **3. Space Technology Needs for Iraq Rebuilding**

The planning for sustainable development requires a large database of relevant information. The data that can be obtained by space technology represent an essential part of this database.

In the last years, an important environment changes have happened in Mesopotamia such as drainage of marshes and building of dams at the upstream of Tigris and Euphrates, in addition to the effects of several wars. These environmental changes need continuous monitoring and good evaluation in addition to performing research and studies to control and improve the environment in Iraq.

On the other hand, the demand to satellite communication has been increased drastically since 2003 and it is still common for Internet coffees using the VSAT. Iraq has now more than 10 satellite TV channels.

## 4. Planning Elements of Space Education and Capacity Building in Iraq

The proposed planning could solve and include the followings:

### *(1) Staff qualification.*

The space technology should be used and applied by highly qualified scientific staff, therefore the planning should include complete program for training and in such special courses dealing with the space technology applications.

## a. Training courses

More than (75) participants from different Iraqi ministries have finished specialized courses in remote sensing and its applications in 2004. These courses have been organized by **Aeronautics & Space Technology Directorate (ASTD)** in Ministry of Science & Technology (MOST)

## **b. Academic Qualification**

The program of post graduate studies in space education has been developed in university of Al-Nahrain. This includes special courses and performing research projects in both Al-Nahrain University and Al-Mustensiria University in the field of satellite technology and remote sensing. Several of MSc and PhD degrees have been awarded in these areas. Most of researchers in **ASTD** have contributed and supervised the post graduate students. Several universities in Iraq have created Remote Sensing Research Centers. They also teach and present special courses in remote sensing and spacecraft engineering. But the number of scientists and engineers and users is insignificant compared with the actual demand to use these technologies by different ministries in Iraq.



## *(2) Consultation service & scientific support*

The **ASTD** provides different consultation services & scientific supports to different ministries in addition to performing custom research and studies in the following fields:

1. GIS applications and remote sensing.
2. GPS applications.
3. Accurate timing system.

The above plan can help the other ministries to create specialized centers for space technologies use. Agreements have been signed with several ministries to provide these services. We expect to include more ministry in the future.



### *(3) Infrastructure building for space technology*

The future plan of ASTD could be essential and based on supports to build an infrastructure of space technology by the followings:

- (a). Create a large data-base system for space images and build the receiving space image earth station from remote sensing satellites in Iraq.
- (b) Establish national centre for storing & archiving the space images in addition to all the achieved researches & studies . This can be available by using the Internet system to contact with the other corresponding international centers.
- (c) Install a network for DGPS services that help the most of Iraqi ministries and private sector
- (d) Build the GIS network for different applications.

# 5. Conclusion

Iraq needs large capacity building effort in space technology to tackle challenges of rebuilding Iraq and rehabilitating the environment, tacking into consideration ignorance of environmental issues during the last decades and the wars. UN sanctions contributed to isolate Iraqi scientists and engineers from technological advances in space field. Such capacity building effort can only succeed when all concerned cooperate; namely:

- (1) Universities, by providing high level education in space technology at the MSc and PhD levels.
- (2) ASTD, by providing short tarn training, consultancy and joint projects with users of space technology.
- (3) The International community by providing training in specialized centers in space technologies focusing on recent advances in this field.