

Professional Education in Digital Remote Sensing in the Federal Republic of Germany

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1. Introduction

In August 1982 the United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82) was convened in Vienna. The recommendations of UNISPACE 82 stressed the fact that there is a serious lack of skilled and competent manpower in the field of remote sensing applied to the development of the earth's resources and that extended scientific and technical training must take place to enable developing countries to make more use of remote sensing techniques for the benefit of development projects and programmes, especially in rural areas.

In line with recommendations of UNISPACE 82 and conscious of the growing importance of adequate rural development, the Government of the Federal Republic of Germany is going to extend the emphasis given to remote sensing technology for rural development in her technical cooperation programme. Within this frame the German Foundation for International Development (DSE) has been entrusted with the organization and implementation of relevant training programmes and courses.

The first international training course on remote sensing applications in Agriculture and Forestry was jointly organized and conducted by the Food and Agriculture Organization of the United Nations (FAO), the German Aerospace Research Establishment (DFVLR) and the German Foundation for International Development (DSE) and was held in Feldafing, Federal Republic of Germany in October 1983.

The second international training course will be jointly organized and conducted by the above mentioned institutions and is scheduled to be held in Feldafing in July 1984.

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## 2. The organizing institutions

### 2.1 Food and Agriculture Organization of the United Nations (FAO)

The Food and Agriculture Organization of the United Nations (FAO) was established to further action by member states to raise level of nutrition of their people, to secure improvement in the efficiency of the production and distribution of all food agricultural products and to better the condition of rural population through contributing towards an expanding world economy and ensuring humanity freedom from hunger.

FAO's major technical division has used aerial photography for many years and the organization has been actively involved for more than a decade in the application of satellite remote sensing.

The FAO Remote Sensing Centre was set up in 1980 following the request of the UN Committee on the Peaceful Use of Outer Space endorsed by the UN General Assembly for the establishment in FAO of a centre to cover renewable resources within the UN system. A second interregional centre is located in the Division of Natural Resources and Energy (DNRE) of the UN Department of Technical Cooperation for Development in New York and is primarily concerned with non-renewable resources.

The main activities of the centre cover assisting the member states to establish national remote sensing centres, as well as cooperation in problem oriented pilot studies; promoting the transfer of appropriate remote sensing techniques to developing countries and providing them with information on relevant development, whether of equipment or procedures; on-the-job-training and the organization of national, regional and interregional training courses, seminars and workshops, on practical applications of remote sensing; assisting in the development and application of new methods and techniques for remote sensing, particularly as related to supporting FAO-executed field projects and headquarter programs involving satellite remote sensing, aerial photography, imagery analysis, photo interpretation, photogrammetry and cartography; coordinating FAO activities in space application and representing FAO at meetings of international bodies or participating in conferences involved in space applications.

### 2.2 German Aerospace Research Establishment (DFVLR)

DFVLR is the largest research establishment dealing with engineering sciences in the Federal Republic of Germany. Its research centres are located in Braunschweig, Göttingen, Cologne-Porz, Stuttgart, and Oberpfaffenhofen near Munich. The establishment is primarily supported by public funds.

## Objectives

The statutory objects of DFVLR are:

- Research, mainly in the aerospace field
- Participation in the planning and realization of projects
- Construction and operation of large-scale testing facilities
- Advanced training of junior scientists
- Assistance and advice to federal government authorities.

In the field of earth observation by means of aerospace technology problems of remote sensing, of atmospheric, and terrestrial phenomena shall be solved. These user-oriented research tasks contribute among others to cartography and regional planning, to solve problems in developing countries and to control and protect the environment.

Research activities of DFVLR in this field extend to investigations and user-oriented developments of remote sensing techniques and -systems. Special research trends are optical, infrared, and microwave measurement technology for the earth's surface and atmosphere as well as the development of simulation and interpretation models for processing of the data gained.

### The Remote Sensing Data Centre of DFVLR

In support of the utilization and application of remote sensing data in the field of remote sensing and meteorology DFVLR makes available a data centre as a service for internal and external users. The task of this establishment is a technical as well as a scientific service and extends from data acquisition through preprocessing, processing, evaluation, and interpretation.

The German Remote Sensing Data Centre primarily serves scientists, governmental administration and industry. It operates on a cost basis in national, bilateral and international activities and functions as a central point of contact for these tasks within the DFVLR.

The German Remote Sensing Data Centre plans, installs and handles an efficient system for data evaluation, preprocessing, interpretation and photographic processing. It coordinates within special tasks the use of aircraft, ground stations, computer centre, etc., of DFVLR.

The constant improvement of these installations, the information and training of users and the cooperation in studies and research projects is an important supplement to the operations function.

### 2.3 German Foundation for International Development (DSE)

The German Foundation for International Development was founded in 1959 and charged with the task of fostering relations between the Federal Republic of Germany and other countries on the fields of development policy. DSE discharges this statutory function within the framework of federal

German technical assistance aimed at supporting the economic, social, and cultural advancement of developing countries in Africa, Asia, and Latin America.

In collaboration with national and international partner organizations at home and abroad, DSE has been conducting for over 20 years now programme events enabling managerial personnel and specialists from over 100 countries of the Third World to engage in an exchange of views and experiences on problems and aspects of international development or undergo advanced training relevant to their profession.

DSE is financed primarily out of Federal Government funds. A number of federal states (in particular Berlin, Baden-Württemberg, Bavaria and North Rhein/Westphalia) also provide financial support for DSE programme events. DSE is headed by a Board of Trustees composed of representatives of federal ministries and governments of the federal states, management and labour, and political and academic life. The Board of Trustees establishes the guideline governing DSE activities. The Director General and the Deputy Director General conduct the business of DSE.

The DSE Executive Offices, the DSE Central Administration, and two DSE Programme Centres are located in Berlin (West). Four further DSE Programme Centres are located in Bonn, Bad Honnef, Mannheim, and Feldafing near Munich.

The DSE Food and Agriculture Development Centre is active in priority areas of agricultural promotion, e.g. plant and animal production, agricultural engineering, irrigation, agricultural planning, management and extension, marketing, credit, cooperatives and self-help organizations, as well as forestry, fishery and ecosystem maintenance.

In collaboration with relevant institutions, training courses are conducted in the Federal Republic of Germany and in other industrial countries for developing country specialists in the fields of agriculture and forestry. Some courses of this nature are also conducted in the developing countries via sur-place or third country scholarship. Most of the courses are tailored to meet individual training needs.

### 3. Guidelines

#### 3.1 Objectives

The main objectives are:

- the transfer of know-how on the possibilities of remote sensing applications in the area of land resources
- the improvement of the use of existing remote sensing facilities for rural development in the countries of the Third World.

The potential user of remote sensing data should be enabled through participation

- to identify applications of remote sensing in their field of responsibility
- to estimate cost and benefit of remote sensing
- to work out project plans and to conduct effective consultations with remote sensing experts
- to analyse remote sensing data and imagery and to prepare the extracted information for use in planning and decisionmaking
- to recognize development trends in the field of remote sensing helpful to developing countries.

### 3.2 Content

- Remote sensing techniques and data processing with special emphasis on new sensors (Metric Camera, MOMS, TM, SPOT)
- Digital and analog analysis of satellite data on land resources with exercises.
- Application areas in the field of agriculture, forestry and hydrology, e.g. classification of land use, crop estimation, recognition of crop diseases, soil degradation
- Cooperation of user with remote sensing centres for planning and conducting projects in rural areas
- Future developments in the field of remote sensing applications for rural development

### 3.3 Method of instruction

The courses will be composed of lectures, problem-solving exercises and guided discussions. Emphasis will be on the application of concepts and on contributions of participants from their own field of experience. In addition, the DFVLR technical facilities will be used for exercises at digital image processing systems.

Actual policy decision-making processes will be simulated with the help of case studies.

The courses are intended for experts and users of remote sensing data with scientific background and specific experience.