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**RECTAS: BLAZING THE TRAIL IN CAPACITY BUILDING FOR  
GEOINFORMATION PRODUCTION AND MANAGEMENT FOR SUSTAINABLE  
MANAGEMENT OF LAND, ENVIRONMENT AND NATURAL RESOURCES  
IN AFRICA**

**RECTAS: BLAZING THE TRAIL IN CAPACITY BUILDING FOR  
GEOINFORMATION PRODUCTION AND MANAGEMENT FOR  
SUSTAINABLE MANAGEMENT OF LAND, ENVIRONMENT AND NATURAL  
RESOURCES IN AFRICA**

**Report of the Activities of  
Regional Centre for Training in Aerospace Surveys (RECTAS)  
Off Road 1, Obafemi Awolowo University Campus  
P.M.B. 5545,  
Ile-Ife, Nigeria.**

Presented at the Second Meeting of the Committee on Development Information (CODI),  
UNECA, Addis Ababa, Ethiopia, 4<sup>th</sup> – 6<sup>th</sup> September 2001.

By

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## **1.0 BACKGROUND INFORMATION**

The need for a Regional Cartographic Centre was first mooted at the 1<sup>st</sup> United Nations (UN) Cartographic Conference held in 1963 in Nairobi, Kenya. Consequently, the 8<sup>th</sup> Session of the Economic Commission for Africa (ECA) Conference of Ministers held in Addis-Ababa, Ethiopia, in 1964 passed Resolution 164 (VIII) calling for the creation of Regional Centres for Training in Photogrammetry, Photo-Interpretation and Airborne Geophysical Surveys. In 1971, four founding member states (Benin, Ghana, Nigeria and Senegal) signed the principal agreement establishing the Centre. Four other member states joined afterwards, namely: Burkina (in 1981), Mali (in 1982), Cameroon (in 1983) and Niger (in 1984). The Centre was declared open on 21<sup>st</sup> October 1972 with the then Executive Secretary of the United Nations Economic Commission for Africa (UNECA), Dr. R.K.A. Gardiner, as the first Chairman of the Governing Council.

The Centre was then known as the Regional Centre for Training in Aerial Surveys (RECTAS) until September 1987 when the name was changed to the Regional Centre for Training in Aerospace Surveys (RECTAS) with its scope broadened to cover Photogrammetry, Remote Sensing Applications and Cartography, including Geographic Information System (GIS) in keeping pace with the modern day technology. Apart from the training capabilities, these major disciplines have very much strengthened the consultancy services unit of RECTAS to carry out important and large projects involving mapping, monitoring and management of natural resources and the environment, through the expertise of the professional staff and “hi-tech” facilities available at the Centre.

## **2.0 OBJECTIVES OF THE CENTRE**

The objectives of the Centre are to:

- (i) provide theoretical and practical training in the field of Geoinformatics including in particular photogrammetry, remote sensing, cartography and geographic information systems and their applications in geophysical surveys, environmental studies, etc;
- (ii) conduct seminars and courses with a view to providing an opportunity to government officials in the region to exchange information and experiences in the field of Geoinformatics;
- (iii) carry out studies and research in the field of Geoinformatics, and;
- (iv) provide advisory and consultancy services to member states of the Economic Commission for Africa (ECA) and other institutions concerned with geoinformation.

## **3.0 NEW ORGANISATIONAL ARRANGEMENT**

Under the new policy of UNECA, the Chairman of RECTAS' Governing Council will now be elected from among its members to serve for two consecutive meetings in rotation. This policy came into operation during the 35<sup>th</sup> Governing Council meeting held on July 5<sup>th</sup>/6<sup>th</sup> 2001 where the Surveyor General of the Federation of Nigeria, Alhaji F.A. Kassim, was elected as the first Chairman under the new arrangement.

The Centre also has a new Management team. Dr. Olajide Kufoniyi (Nigeria) assumed duty as the new Director on 1<sup>st</sup> September 2000 and Mr. Massaër Mbaye (Senegal) assumed duty as the new Deputy Director on 1<sup>st</sup> January 2001.

## **4.0 EDUCATION AND TRAINING PROGRAMMES**

RECTAS' courses are bilingual: English and French, and are conducted at three levels of Technician, Technologist and Post-graduate for the regular courses.

### **4.1 Regular (Long-duration) Programmes**

Until the year 2000, two courses were run namely: Photogrammetry and Remote Sensing/GIS. In 1989, 1990 and 1993, the Centre also conducted, on request, courses at Operator level in Photogrammetry.

In May 2000, the Post-graduate (PG) course was modernized with the introduction of the integrated programme in Geoinformation Production and Management with specializations in:

- a. Photogrammetry and Remote Sensing
- b. Geographic Information Systems
- c. Cartography

As indicated in Tables 1 and 2, a total of 961 students completed their training at different levels in the old programmes of Photogrammetry and Remote Sensing from 1973 to the end of 2000, while the first set of 15 students in the new PG course graduated in May, this year. Table 1 also shows that the total 976 trainees, excluding short-term training, originated from 27 African countries.

The new programme also commenced with 49 students at the Technician and Technologist levels in May 2001.

The new curricula in Geoinformation Production and Management at Technician, Technologist and Postgraduate Diploma are summarized below:

#### **4.1.1. Technician Diploma Course (GPM.5)**

##### **(a) Objectives**

After the training, depending on the area of specialisation, the graduate should be capable of performing very competently the routine tasks associated with the following: digitization/scanning of maps, spatial data acquisition from photogrammetry and remote sensing, database creation, attribute data entry into a geo-database and cartographic processes.

##### **(b) Entry Qualifications**

- i. GCE/OL with credit in English, Maths, Physics, Chemistry, and Geography.
- ii. At least 2 years post-qualification experience.

##### **(c) Course Structure**

The Technician Diploma course is designed for duration of eighteen months, and is organized in four blocks. The first block, which is common to all course participants, is structured in three basic modules of learning activities in Geoinformation technology in the context of the applications in which it is used; it is therefore very much problem oriented. The second block of introduction to spatial data acquisition systems is also common to all trainees. The third block, the specialization block, is in turn structured with four modules based on the applicant's proposed area of specialization. The last block is the final project. More details are indicated below.

GPM		
<b>Block 1 - Common Modules 1-3: Introduction to Computing (18 weeks)</b>		
Module 1: Introductory mathematics (6 weeks)		
Module 2: Basics of computer systems (6 weeks)		
Module 3: Introduction to databases (4 weeks)		
<b>Block 2 - Common Modules 4-8: Introduction to Spatial Data Acquisition Systems (23 weeks)</b>		
Module 4: Introduction to Digital Photogrammetry and Remote Sensing (6 weeks)		
Module 5: Analogue to Digital Data Conversion (Scanning and Digitizing) (8 weeks)		
Module 6: Introduction to point determination systems (2 weeks)		
Module 7: Introduction to GIS (4 weeks)		
Module 8: Introduction to Cartographic visualization (3 weeks)		
<b>Block 3: Modules 9-13: Specialization (15 weeks)</b>		
<b>Photogrammetry and Remote Sensing</b>	<b>Geographic Information Systems</b>	<b>Cartography</b>
Module 9: Photogrammetric methods of data Acquisition (4 weeks)	Module 9: Introduction to GIS functionalities (3 weeks)	Module 9: Cartographic symbolization (3 weeks)
Module 10: Remote Sensing data acquisition (4 weeks)	Module 10: Introduction to GIS Software Packages (3 weeks)	Module 10: Map composition (3 weeks)
Module 11: Topographic information extraction (2 weeks)	Module 11: Spatial/non-spatial databases (3 weeks)	Module 11: Introduction to Topographic Cartography (3 weeks)
Module 12: Thematic information extraction (2 weeks)	Module 12: Elementary spatial analysis (3 weeks)	Module 12: Introduction to Thematic Cartography (3 weeks)
Module 13: Individual Project (3 weeks)	Module 13: Individual Project (3 Weeks)	Module 13: Individual project (3 weeks)
<b>Block 4: Module 14-15: Study Visit and Final Project (11 weeks)</b>		
Module 14: Study visit (1 week)		
Module 15: Final Project (10 weeks)		

#### 4.1.2 Technologist Diploma Course (GPM.4)

##### (a) Objectives

The main objective is to provide a comprehensive training in theory and practice in the field of Geoinformatics at the level of supervisors. After the training, the graduate should be capable of performing very competently the routine tasks performed by the technician and in addition should be able to carry out laboratory maintenance and supervision, and spatial analysis of georeferenced data.

Furthermore, the Technologist should have the capacity to supervise Technicians in the routine tasks and relate to professionals in the planning and execution of Geoinformatics projects, and write draft project reports.

##### (b) Admission requirements

- GCE/AL with credit in 2 cognate subjects including Maths, and general entry qualification to University or Upper Credit Technician Diploma in Photogrammetry,

- Remote Sensing, Cartography, Surveying or any of the Environmental or Earth sciences;
- ii. At least 2 years post qualification experience.

### (c) Course Structure

The Technologist Diploma course is designed for duration of eighteen months, and is organized in four blocks. The first two blocks, which are common to all course participants, are structured in three modules each, of learning activities in Geoinformation technology. The third block, the specialization block, is in turn structured with five modules based on the applicant's proposed area of specialization. The last block is the final project. Details are indicated below:

<b>Block 1 - Common Modules 1 - 3: Basic Computing (16 weeks)</b>		
<b>Module 1:</b> Basic mathematics (6 weeks) <b>Module 2:</b> Fundamentals of computer Systems (6 weeks) <b>Module 3:</b> Fundamentals of databases (4 weeks)		
<b>Block 2 - Common Modules 4 - 6: Principles of Geoinformatics (21 weeks)</b>		
<b>Module 4: Spatial Data Acquisition Techniques (12 weeks)</b> <ul style="list-style-type: none"> <li>• Primary Data Acquisition Methods (2 weeks)</li> <li>• Georeferencing (2 weeks)</li> <li>• Image Products and Interpretation (4 weeks)</li> <li>• Introduction to DTM (4 weeks)</li> </ul> <b>Module 5:</b> Digital mapping and cartographic visualisation (6 weeks) <b>Module 6:</b> Fundamentals of GIS (3 weeks)		
<b>Block 3: Modules 7 - 11: Specialization (20 weeks)</b>		
<b>Photogrammetry and Remote Sensing</b> <b>Module 7:</b> Photogrammetric Techniques (4 weeks) <b>Module 8:</b> Remote Sensing Techniques (5 weeks) <b>Module 9:</b> Topographic Databases (4 weeks) <b>Module 10:</b> Thematic databases (4 weeks) <b>Module 11:</b> Individual Project (3 weeks)	<b>Geographic Information Systems</b> <b>Module 7:</b> Hardware and Software Components of GIS (5 weeks) <b>Module 8:</b> Introduction to spatial data modeling (3 weeks) <b>Module 9:</b> Spatial/non-spatial database creation (5 weeks) <b>Module 10:</b> Spatial analysis (4 weeks) <b>Module 11:</b> Individual Project (3 Weeks)	<b>Cartography</b> <b>Module 7:</b> Cartographic Design and Presentation (5 weeks) <b>Module 8:</b> Topographic Information Visualization (4 weeks) <b>Module 9:</b> Thematic Information Visualization (4 weeks) <b>Module 10:</b> Introduction to Web-Cartography (4 weeks) <b>Module 11:</b> Individual Project (3 weeks)
<b>Block 4: Module 12 - 14: Project Planning (11 weeks)</b>		
<b>Module 12:</b> Planning (1 week) <b>Module 13:</b> Study visit (1 week) <b>Module 14:</b> Final Project (9 weeks)		

### 4.1.3 Post-Graduate Diploma Course

#### a. Objectives

This is designed for management level training for duration of 12 months. Upon completion of the course, participants should be able to contribute to the design,

implementation and management of geoinformation production systems and quality control systems

#### **b. Admission Requirements**

To be considered for admission to the GPM.3 course, applicants should hold a university degree (B.Sc. or equivalent) from a recognized University with a good background in Mathematics and have some years of operational experience in disciplines related to Geoinformatics.

#### **c. Course Structure**

The Post Graduate Diploma course is organised in five blocks. The first block is common to all course participants and is structured in three modules of learning activities in GIT. The second block of one module, which is also common to all course participants, deals with the various methods of spatial data acquisition and information extraction. The third block, the specialization block, is in turn structured in 4 modules based on the applicant's proposed area of specialization. Block 4 deals with modern techniques of information technology management. The last block is the execution of the final project.

Geoinformation Production and Management Systems		
<b>Block 1 - Common Modules 1 - 3: Advanced Mathematics and Computing (6 weeks)</b>		
<b>Module 1: Advanced Mathematics (3 weeks)</b> <ul style="list-style-type: none"> <li>• Logic and set theory (3 days)</li> <li>• Linear algebra (3 days)</li> <li>• Graph theory, Co-ordinate systems, geo-referencing, datums and transformations (5 days)</li> <li>• Statistics and theory of observations (4 days)</li> </ul> <b>Module 2: Computer Applications (2 weeks)</b> <ul style="list-style-type: none"> <li>• Operating Systems (2 days)</li> <li>• Computer Programming (5 days)</li> <li>• Introduction to Information and Communication Technology (3 days)</li> </ul> <b>Module 3: Database Systems (1 week)</b> <ul style="list-style-type: none"> <li>• Review of Database Structures (2 days)</li> <li>• Database design and creation (3 days)</li> </ul>		
<b>Block 2 - Common Module 4: Spatial Data Acquisition and Information Extraction (14 weeks)</b>		
<b>Module 4 – Spatial Data Acquisition and Information Extraction</b> <ul style="list-style-type: none"> <li>• Primary Data Acquisition (1 week)</li> <li>• Image Products (2 weeks)</li> <li>• Geo-referencing and DTM generation (2 weeks)</li> <li>• Information extraction (2 weeks)</li> <li>• Scanning and Digitizing (2 weeks)</li> <li>• Principles of GIS (2 weeks)</li> <li>• Computer Assisted Cartography (3 weeks)</li> </ul>		
<b>Block 3 - Modules 5 - 8: Specialization (12 weeks)</b>		
<b>Photogrammetry and Remote Sensing</b>  <b>Module 5:</b> Analytical and Digital Photogrammetry (3 weeks) <b>Module 6:</b> Remote Sensing Applications (3 weeks) <b>Module 7:</b> Topographic and Thematic Information extraction (3 weeks) <b>Module 8:</b> Individual Project (3 weeks)	<b>Geospatial Information Systems</b>  <b>Module 5:</b> Spatial data structures and Algorithm (2 weeks) <b>Module 6:</b> Spatial database design (3 weeks) <b>Module 7:</b> GIS Applications (4 weeks) <b>Module 8:</b> Individual Project (3 weeks)	<b>Cartography</b>  <b>Module 5:</b> Cartographic Principles (3 weeks) <b>Module 6:</b> Topographic and Thematic Cartography (3 weeks) <b>Module 7:</b> Desktop and Web-Cartography (3 weeks) <b>Module 8:</b> Individual Project (3 weeks)
<b>Block 4 - Common Modules 9 - 11: Production System Management (3 weeks)</b>		
<b>Module 9:</b> Project Management (1 week) <b>Module 10:</b> System Development Methodologies (1 week) <b>Module 11:</b> Study Visit (1 week)		
<b>Block 5 - Module 12: Final Project and Presentation (10 weeks)</b>		

#### 4.1.4. Target Groups for the Courses

The courses are intended for those who are involved in the operational use of integrated geoinformation production and management systems in:

- national survey and mapping organisations;
- application oriented organizations (e.g. cadastre, local authorities, utilities companies, natural resources surveys, environment, private geoinformation production organizations),
- private sector, NGO, etc.



#### **4.1.5. Accommodation**

Course participants are accommodated in RECTAS' Hostels, situated within the Centre's premises or in the University students' hostels inside the Obafemi Awolowo University Campus.

#### **4.1.6. Application Procedure**

All candidates must submit duly completed application forms to the Director of the Centre not later than the 1<sup>st</sup> of November of the year preceding the intended year of study in the case of courses starting in April (Technician and Technologist), or the 1<sup>st</sup> of May of the intended year of study for course beginning in October (Post-Graduate Diploma), accompanying them with the following:

- i. Certificate of good stereoscopic vision;
- ii. Certificate of medical fitness (vide application form);
- iii. Statement of candidate's financial support;
- iv. 3 passport-sized photographs;
- v. photocopies of degrees, diplomas, certificates and other credentials, originals of which shall be presented on arrival at the Centre (upon admission).

All completed forms, duly signed, should be returned to the Director of the Centre. Applicants from RECTAS' member states should route their applications through the Official Representative of their Government.

Candidates who wish to apply from other countries can send their applications through their sponsors to the Centre at the following address:

The Director  
Regional Centre for Training in Aerospace Surveys (RECTAS)  
Off Road I, Obafemi Awolwo University Campus  
PMB 5455, Ile-Ife, Osun State, Nigeria

Candidates are advised to source for fellowship through their organizations as RECTAS does not have the funds to sponsor students.

#### **4.2 Short Courses**

The modular design of the regular programmes provides opportunity for interested candidates to attend short-term training and retraining in any module or combination of modules of their choice. Thus organizations that are unable to release their staff for a long duration programme now have the opportunity to send candidates for short-term courses consisting of one or more modules in core areas of their activities. Apart from the modules, user-defined training courses either at RECTAS or in-house within the user's organization can also be mounted.

### 4.3 Fee Schedule

#### Regular Programmes:

	Technician	Technologist	Postgraduate
Student on Fellowship from Member state	\$7640	\$7815	\$6265
Student on Fellowship from non-member state	\$8640	\$8815	\$7265
Private Student	\$6085	\$6185	\$4490

The cost includes accommodation and lecture materials.

#### Short Courses:

For modules of less than 4 weeks duration: \$100.00 per week

For modules of 4 weeks duration or longer: \$400.00 per module.

The cost includes accommodation in students' hostel and lecture materials.

## 5.0 PROGRAMMES UNDER CONSIDERATION

### 5.1 Masters Programme

During the International Workshop on the evaluation of the past ten (10) years of RECTAS activities and its mid-term Development Perspectives (held in Ibadan, Nigeria from 29th to 31st May, 2000), member States indicated a strong desire to have opportunity of M.Sc. training in Geoinformation Production and Management at RECTAS. This is indeed true when one considers the fact that trainers in our various countries also require further training while production organizations need to have a strong research and development units in their organizations. An on-going discussion on M.Sc. collaboration between the Federal School of Surveying (FSS), Oyo, Nigeria, and the International Institute for Aerospace Surveys and Earth Sciences (ITC) was therefore expanded to include the Regional Centre for Training in Aerospace Surveys (RECTAS), Ile-Ife, Nigeria, and the Groupement pour le Développement de la Télédétection Aérospatiale (GDTA), Toulouse, France.

The project idea has been given the name:

**Capacity Building for Geoinformation Production and Management for Sustainable Land, Environment and Natural Resources Management (CABGLEN).**

As indicated above, the collaborating Institutions are:

- Federal School of Surveying, Oyo, Nigeria.
- Regional Centre for Training in Aerospace Surveys (RECTAS), Ile-Ife, Nigeria.
- International Institute for Aerospace Survey and Earth Sciences (ITC), Enschede, The Netherlands.
- Groupement pour le Developpement de la Teledetection Aérospatiale (GDTA), Toulouse, France.

### **5.1.1. Brief Description of the Project**

The proposed project is directed at strengthening the educational and training abilities of the Regional Centre for Training in Aerospace Surveys (RECTAS), Ile-Ife, and increasing the speed of modernization of the Institution. The Centre will then be able to produce graduates with the skills to solve problems in the areas of geospatial information production, land management, land reform, cadastre, optimization of geoinformatics processes, etc. This will enhance capacity building for Geoinformation production and management for sustainable land, environment and natural resources management in the member states of the Economic Commission for Africa.

This can be achieved by transferring ITC and GDTA courses/course elements to FSS and RECTAS educational programs.

The following four programs have been identified for implementation under the proposed project:

- (1) M.Sc in Geoinformation Production and Management as sandwich programme with ITC or GDTA.

This course is designed for BSc holders in requisite courses and who have successfully completed RECTAS' Postgraduate Diploma in Geoinformation Production and Management or equivalent (please see Annex A).

If the M.Sc course is run at least twice at RECTAS/FSS, it can be used to upgrade RECTAS staff as well as train teaching staff of other educational institutions and management staff of production sector. The multiplier effect will be substantial and also of benefit to RECTAS. Some of the benefits include the following:

- Lecturers and Instructors of the M.Sc will participate in teaching and designing courses at Professional Masters, PGD, Technologist and Technician levels.
- Instruments and software used will also be available to the lower level courses.
- The modular nature of the courses will facilitate the running of short-term courses for critical staff that cannot be released for long duration courses.

- (2) Professional Masters (PM) in Geoinformation Production and Management, with specialization in:
  - (a) Photogrammetry and Remote Sensing
  - (b) Cartography and Geoinformation Visualization
  - (c) Spatial Information Systems
  - (d) Optimization of Geoinformation Processes.

The course would be run at FSS and RECTAS as a continuous program of FSS PGD GIS or RECTAS GPM 3 course with a final project. It is designed for 15 months for the training of professionals and mid-career officers from various institutions and production organizations.

(3) Three months certificate course in any of the following four specialization modules of the PM course to be run at RECTAS and FSS:

- Photogrammetry and Remote Sensing
- Cartography and Geoinformation Visualization
- Spatial Information Systems
- Optimization of Geoinformation Processes

This course is designed for the upgrading of staff of the various institutions of learning and production organizations.

(4) Refresher courses and workshops of duration of one to four weeks to be run at FSS and RECTAS.

Designed for upgrading of executive level and senior managers on such topics as Desktop Digital Mapping, GI Infrastructure, LIS Implementation, Spatial Data Updating, Optimization procedures, Computer Assisted Surveying, etc. to be held at FSS and RECTAS.

The above academic courses are to be used as integral components of the RECTAS and FSS academic programmes, and will continue beyond the period of the project. We are currently sourcing for funding from donor agencies for the proposed project.

#### **5.1.2 Target Beneficiaries**

The prime beneficiaries of the project are: the member states of RECTAS (Benin, Burkina, Cameroun, Ghana, Mali, Niger, Nigeria, and Senegal) and other countries in the African region. To benefit in all the countries are specifically the various sectors of the national economy that produce and/or use spatial information including other surveying and mapping training institutions.

#### **5.2 Web-based Distance Learning**

The rate of development in Geoinformation Technology (GIT) is so rapid that it is often difficult for staff to be constantly retrained to keep pace with the rapid technological development. The solution to this problem is to provide web-based distance learning programmes in UNECA's specialized Regional training centres.

RECTAS is therefore making effort to have full internet connectivity at the Centre with a web-site in order to start the *e-learning* programme. This facility will enable RECTAS' alumni and other personnel in Geoinformation production organizations in member states of ECA to keep abreast with the developments in GIT. We are therefore soliciting for the assistance of donor agencies to realize this important objective.

### **6.0 TRAINING FACILITIES**

In addition to the skilled manpower available in RECTAS, the Centre has modern Digital Photogrammetry and Remote Sensing, Geographic Information System and Cartography

Laboratories, which are well-equipped with modern hardware and software including state-of-the-art GIS software packages.

## **7.0 CONSULTANCY SERVICES**

The Centre is well set-up for consultancy services in the areas of short-term/customized training and production-related jobs. Customized training can be arranged for organizations either at RECTAS or in their organization in all aspects of geoinformatics and its applications according to the user-defined needs.

RECTAS also has capabilities for advisory, consultancy or direct execution of jobs in the above-mentioned areas. Some of the jobs executed recently by RECTAS either singly or under joint venture include:

(a) Environmental sensitivity index (ESI) mapping of some Shell Development Company's Oil Fields in Nigeria. In collaboration with Mail Oil Field services Ltd., July 1997

(b) National Workshop on Agricultural and Environmental Applications of Remote Sensing and GIS. Jointly organized by FAO/RECTAS/NASENI (National Agency for Science and Engineering Infrastructure) in Nov/Dec 1994.

(c) Digital Base Map Production of Ibadan, Nigeria at 1/25,000 and 1/50,000 scales for the Sustainable Ibadan Project (SIP), United Nation's Centre for Human Settlements (UNCHS). Completed in 1995.

(d) A GIS Database for the secretariat of Economic Community Of West African States (ECOWAS) showing natural resources, roads, main towns, hydrography, socio-economic and military/political aspects of the community including areas of military intervention by ECOMOG and refugee data. Started in March 2001 and nearing completion.

(e) Training workshop on the development of Hadejia River Basin Information System, Nigeria; including database design and actual implementation with real datasets. May and June 2001. Funded by Embassy of France in Nigeria.

(f) Production of 1/25000 scale digital base maps of three towns in Ebonyi state in Nigeria, in collaboration with Helzek Systems Nigeria. Started in September 2000 and nearing completion.

## **8.0 CONCLUSION**

The need for capacity building in Geoinformation Production and Management in Africa cannot be over-emphasised as geospatial information is definitely the sine-qua-non for sustainable national development. The founding fathers of RECTAS (UNECA) and the member states should therefore be credited for putting in place RECTAS, which has recently been classified by UNECA as a Centre of Excellence in Geoinformatics.

The present status of RECTAS has been made possible through the support of the member states that have been paying their annual contributions regularly, the support of UNECA and the support of International donor agencies and countries, especially the French Government, the European Union and the Netherlands Government.

We also acknowledge and appreciate the contribution and support of our development partners, especially the International Institute for Aerospace Survey and Earth Sciences (ITC), Enschede, The Netherlands and GDTA, Toulouse, France.

On behalf of RECTAS, I want to thank these countries and organizations. I also want to strongly appeal to other international organizations and agencies, and other donor countries to continue to offer technical assistance to RECTAS to achieve self-sustainable growth. These include such organizations as UNDP, UNESCO, DFID, DSE, GTZ, UNITAR, UNEP, UNFPA, USAID, CIDA, ADB, FAO, World Bank, Arab Development Bank, JICA, European Union, etc and such countries as Switzerland, Finland, Belgium, Germany, Sweden, Japan, Canada, USA, etc.

In addition, I wish to urge African states, especially West African countries, which are not yet participating member states of RECTAS to join by signing the Principal Agreement Document establishing the Centre.

**APPENDIXES:****Table 1: NUMBER OF STUDENTS TRAINED FROM DIFFERENT COUNTRIES  
(1973 – 2001)**

S/N	Country	No. of Students Trained
1	Benin	80
2	Burkina	34
3	Cameroon	80
4	Ghana	101
5	Mali	28
6	Niger	21
7	Nigeria	511
8	Senegal	69
9	Algeria	3
10	Burundi	1
11	C. Africa	1
12	Cote d'Ivoire	1
13	Ethiopia	2
14	Kenya	4
15	Lesotho	2
16	Libya	2
17	Malawi	11
18	Rwanda	2
19	Sierra Leone	2
20	Somalia	2
21	Sudan	1
22	Swaziland	1
23	Uganda	2
24	Dem. Rep. of Congo	10
25	Zambia	1
26	Zimbabwe	2
27	Namibia	2
	<b>TOTAL</b>	<b>976</b>

**TABLE 2: NUMBER OF TRAINEES AT RECTAS/FIELD OF STUDY**  
(1973 - 2001)

Year		PHOTOGRAMMETRY				REMOTE SENSING					Total/ year Ph. & RS	Yearly cumul Total Ph. & RS
	Oper.	Tnc	Tno	PG	Total /year	Photo interp	Tnc	Tno	PG	Total/ year		
1972												
1973		11			11						11	11
1974		7			7						7	18
1975	5	19			24						24	42
1976	6	25			31						31	73
1977	3	19			22						22	95
1978	6	15			21						21	116
1979												
1980	4	16			20						20	136
1981	5	17			22						22	158
1982	7	12			19						19	177
1983	5	7			12	19					31	208
1984	8	16			24						24	232
1985	3	24			27	3					30	262
1986	5	17	5		27	1					28	290
1987	11	13	18		42	2					44	334
1988	5	26	8		39	6					45	379
1989	1	15	22	7	45				8	8	53	432
1990	2	19	19	-	40		3			3	43	475
1991	-	19	21	9	49		5	6	7	18	67	542
1992	-	17	17	8	42		9	8	5	22	64	606
1993	2	9	28	7	46		11	11	5	27	73	679
1994		12	22	3	37		-	-	7	7	44	723
1995		13	13	-	26						26	749
1996		10	10	2	22		4	6	8	18	40	789
1997		12	12	-	24		9	12		21	45	834
1998		4	8	5	17		7	8	13	28	45	879
1999		7	13	2	22		4	11	8	23	45	924
2000	-	3	11	-	14	-	8	15	-	23	37	961
TOTAL Up to 2000	78	383	217	43	721	31	52	62	61	206	961	
2001	New PG Course (GPM 3)										15	976
Total Up to 2001											976	976

Oper. = Operator      Tnc = Technician      Tno = Technology      PG = Post Graduate



## Annex A

### Development of MSc Programme in Geoinformation Production and Management

A joint initiative by RECTAS, FSS, ITC and GDTA

