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Report of the Scientific and Technical Subcommittee on its forty-third session

**REPORT OF THE AFRICAN REGIONAL CENTRE FOR SPACE SCIENCE
AND TECHNOLOGY EDUCATION – IN ENGLISH LANGUAGE (ARCSSTE-E)**

(Affiliated to the United Nations)

In paragraph 19 of its resolution 60/99, the General Assembly agreed that the regional centres for space science and technology education, affiliated to the United Nations, should continue to report to the Committee on the Peaceful Uses of Outer Space on an annual basis.

The present document contains the report of the African Regional Centre for Space Science and Technology Education – in English Language (ARCSSTE-E), as submitted by the Centre to the Office for Outer Space Affairs.



1. Introduction

1. This report covers activities of the Regional Centre in the period 2005-2006. The African Regional Centre for Space and Technology Education -- in English Language, (ARCSSTE-E), has been mandated by the Office for Outer Space Affairs to undertake capacity building in key areas of space science and technology applications for indigenous educators from anglophone African countries through training, research and development activities for sustainable development. The Centre, which was inaugurated in November 1998, has the following African countries as Member States: Ghana, Liberia, Uganda, Kenya, Ethiopia, Zambia, Tanzania, Sudan, South Africa, Malawi, Zimbabwe, Gambia, Sierra Leone, Cameroon, Botswana, Lesotho, Egypt and Nigeria. At present, however, there is very little success achieved towards putting a functional Governing Board, comprising the Member States, in place. Due to the nonexistence of the Governing Board, the day-to-day administration for the Centre is the responsibility of the Director under the supervision of the National Space Research and Development Agency (NASRDA) of the Federal Ministry of Science and Technology of Nigeria.

2. The Centre also serves as an activity centre for NASRDA. Particularly, it is tasked with the responsibility to promote space science and technology education at elementary and secondary school levels and to create awareness among the Nigerian public of the benefits of space technology. The Centre is wholly funded by the Nigerian Government, which pays for the personnel, overhead costs and the capital expenses. The Office for Outer Space Affairs provides limited financial resources for travel support for scholars, participating in the 9-month post-graduate courses, organized by the Centre. As the host institution of the Centre, the Obafemi Awolowo University is responsible for office accommodation and the municipal charges incurred by the Centre.

3. The Centre runs a 9-month post-graduate diploma programme in the following areas of space science and technology application: remote sensing and the geographic information system (GIS), satellite meteorology and global climate, satellite communications, and space and atmospheric science. Since the Centre began this programme in 1999, more than 50 participants have benefited. During the period 2005 to 2006, several scientific activities: trainings, workshops, and public enlightenment campaigns, were undertaken by the Centre.

4. In June 2006, the Centre inaugurated a Scientific Steering Committee (SSC) comprising of 12 experts in the areas of space science and technology, to provide guidance on the quality of the academic programmes.

2. Capacity building in space science and technology applications

5. It is the main mission of the Centre to build a high quality capacity of indigenous educators in English-speaking African countries for the application of space science and technology for sustainable national, regional and continental development. To this end, the Centre runs post-graduate diploma courses in space science and technology applications as contained in the education curricula adopted for the regional centres for space science and technology education, developed through activities of the Office for Outer Space Affairs. The Centre's first post-graduate diploma course was in remote sensing/GIS and it was conducted in 1999. At that time, there was little or no involvement at all of other African nationals and the majority of course participants were from the Nigerian armed forces.

6. In 2005, in order to reposition the delivery of the post-graduate diploma programme, particularly for the regional participation, the Centre appropriated funds for scholarships for the foreign participants. Considerable efforts were also made to put in modern teaching resources (furniture, computers, software and databases) and personnel. All the courses (except the projects

and practicals) are being taught in-house in standard lecture rooms using multimedia projectors and audio-visual aids. Each of the participating students are provided with personalized desktop computer systems (Pentium V with processor speeds higher than 2.5GHz) throughout their 9-month stay on the post-graduate diploma programme. Moreover, all the computer systems are fully connected to the Internet. In addition, the Centre has acquired relevant data reduction and processing software like MATLAB, ERDAS Imagine, ARCVIEW GIS, ILIWIWIS, etc. The resource persons engaged for teaching of the post-graduate diploma courses are senior and experienced academics (professors) teaching in the universities and research institutions in Nigeria with specializations in areas of relevant interest.

7. As the flagship of the academic programmes at the Centre, the postgraduate diploma programme offered by ARCSSTE-E has now been repackaged to provide financial support for eligible students from the other Member States in Africa. Lack of financial support for fellowships (tuition and living allowances) and travel hitherto had prevented admission of eligible participants in the past. Virtually all of the 87 foreign applicants for admission into the 2006 post-graduate diploma programme needed scholarships to be able to undertake the 9-month training in Nigeria. After due consultations with NASRDA, the Centre was able to offer 20 scholarships to foreign applicants to cover the costs for tuition and living expenses, while the travel support was covered partially by financial resources received from the Office for Outer Space Affairs.



8. Due to the limited financial resources available to the Centre, only the remote sensing/GIS course could be started in January 2006. The distribution of admission amongst the African Member States was as follows: Nigeria (11), Kenya (4), Uganda (1), Zambia (1), Malawi (1), Ethiopia (4), Sudan (2), Liberia (1), Gambia (1), South Africa (1) and Cameroon (4). The foreign course participants arrived in Nigeria in the week of 21-24 January 2006 and they were all accommodated at the university postgraduate hall of residence. Orientation programmes (cultural lectures, excursions, registration, etc.) began immediately. By the first week of February 2006, lectures commenced fully and the course topics were assigned and taught in a modular form. The

opening ceremony for the course was held on 20 February 2006. The RS/GIS course is packed with lectures, practicals and tutorials, during the weekdays. According to the time frame being followed, it is anticipated that the post-graduate diploma course should end by the mid of October 2006.

9. The Centre sponsored the participation of 25 RS/GIS students at an International Stakeholders' Workshop on Geo-Information System-Based Forest Monitoring in Nigeria held in Abuja from 27 to 30 March 2006. The class will also participate in a Schools' Workshop on Space Education to be conducted at the Centre on 17 and 18 July 2006.

10. The Centre is concurrently conducting 9-month post-graduate diploma courses in satellite communication and space and atmospheric sciences. The participants for these two groups are mostly officers from the Nigerian armed forces: the Navy, Army, Air Force and Police.

3. Local, regional, and international cooperation

11. The Centre is in partnership with scientists in the Nigerian universities that are actively engaged in space science and technology research and applications for development. During 2005, the following projects were supported by the Centre:

- (a) The Nigerian Mesoscale Experiment (NIMEX) – this project is undertaken by the Centre in collaboration with researchers from the University of Ibadan, the Federal University of Technology at Akure and the Obafemi Awolowo University in Ile-Ife. Overseas collaborators are the Department of Micrometeorology, University of Bayreuth, Germany and International Programmes in the Physical Sciences (IPPS) of Uppsala University, Sweden.
- (b) Monitoring of deforestation and its implications for biodiversity using NigeriaSat-1 and other satellites data – the principal investigators are the Institute of Ecology and Environmental Studies of Obafemi Awolowo University (headed by Prof. Balogun and Prof. Salami).
- (c) The Director of the Centre, Professor Jegede, was in Rabat, Morocco, in July 2005, on the invitation of the African Regional Centre for Space Science and Technology Education -- in French Language (CRASTE-LF). The visit opened possibilities for cooperation between the two Regional Centres in Africa, particularly for exchange of information and sharing of resources.
- (d) In December 2005, the Centre acquired, through the Office for Outer Space Affairs, donated Landsat data.
- (e) The GLOBE Programme Director, Dr Teresa Kennedy, did indicate willingness to serve on the Governing Board of the Centre.

4. Outreach, awareness, and programmes

12. The Centre has featured on programmes on the local TV campaigning for public awareness on issues concerning space science and technology education. It has also established partnership for a workshop sponsored by the United Nations Educational, Scientific and Cultural Organization (UNESCO) for promoting science education amongst secondary schools students. On 10 October 2005, the Centre celebrated World Space Week, as a one-day event to popularize space science amongst invited schoolchildren both at the elementary and secondary levels. The Centre is now in the process of updating its webpages, hosted on the Obafemi Awolowo University server. A mini-workshop has been set up at the Centre for the modelling of space

hardware (fabricating mock-ups of satellites, launchers, etc.).

5. Visitors Received by the Centre

13. During the period 2005-2006, the Centre received the following distinguished visitors:

- (i) Ms. Yolander Berenguer, UNESCO, Paris (May 2005).
- (ii) Professor R A Boroffice, Director General, NASRDA (August 2005).
- (iii) Colonel H A Ayoola, Nigerian Army Signals Corps (October 2005).
- (iv) Professor R Durodoye, University of North Texas, United States (November 2005).
- (v) Dr J A Akinyede, Director, Space Applications, NASRDA (December 2005).
- (vi) Professor Jimmy Adegoke, University of Missouri, Kansas-City, United States (June 2006).