

# RECTAS: STRATEGIES AND SYNERGY OF ACCOMPLISHING OBJECTIVES, VISION AND COLLABORATIVE RESEARCH

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## ABSTRACT

The Regional Centre for Training in Aerospace Surveys (RECTAS) was established in 1972 under the auspices of the United Nations Economic Commission for Africa (UNECA) as a joint Institution of African countries currently constituted by Benin, Burkina, Cameroon, Ghana, Mali, Niger, Nigeria (host country) and Senegal. RECTAS' vision is to be a leading centre of excellence providing one-stop solution for quality geospatial science training, education and research and critical capacity for sustainable development in Africa. The mission is to contribute to rapid sustainable development of member states in particular and Africa in general, through the development of critical capacity for timely delivery and responsible use of appropriate geospatial information. In this presentation the strategies and synergy of accomplishing the objectives, vision and mission of the Centre as well as prospects of collaborative research are discussed.

## RESUME

### Résumé

Le Centre Régional de Formation aux Techniques des Levés Aérospatiaux (RECTAS) a été créé en 1972 sous les auspices de la Commission Economique des Nations Unies pour l'Afrique (CENUA) en tant qu'institution conjointe de pays Africains constitué actuellement par le Benin, le Burkina, le Cameroun, le Ghana, le Mali, le Niger, le Nigeria (pays hôte) et le Sénégal. La vision du RECTAS est d'être le premier centre d'excellence fournissant une solution finale pour une formation de qualité dans la science de l'information géographique, l'éducation et la recherche et le développement de capacité critique pour le développement durable de l'Afrique. La mission est de contribuer au développement durable rapide des pays membres en particulier et de l'Afrique en général, à travers le développement de capacité critique pour la production opportune et l'utilisation responsable de l'information aérospatiale appropriée. Dans cette présentation, les stratégies et synergies de réalisation des objectifs, vision et mission du Centre ainsi que les perspectives de recherche conjointe ont été discutées.

## INTRODUCTION

In the 1970s the urgent need for indigenous experts and critical capacity in the mapping sciences in African mapping organisations and institutions was highly imperative. Consequently, the United Nations Economic Commission for Africa (UNECA) sponsored the establishment of the Regional Centre for Training in Aerospace Surveys (RECTAS) as a joint institution of African countries in October 1972. The Centre was sited in a 20 hectares land in the Campus of the University of Ife (now Obafemi Awolowo University) at Ile-Ife, Nigeria. The Countries that signed the instrument of agreement and thus formed members of the Governing Council were Benin, Burkina, Cameroon, Ghana, Mali, Niger, Nigeria (host country) and Senegal. UN-ECA is also represented in the Governing Council. The Centre has UN diplomatic status, immunities and privileges as published in the Federal Republic of Nigeria official gazette No. 67, Vol. 70 of 22<sup>nd</sup> December, 1983. In the instruments of establishment, the member countries' contribution to the recurrent budget is ranked according to their GDP; while Nigeria (the host country) is fully responsible for the infrastructural development of the Centre by special provisions in her capital budgets.

The vision of RECTAS is to be a leading *centre of excellence* providing one-stop solution for quality geospatial science training, education and research and critical capacity for

sustainable development in Africa. The mission is to contribute to rapid sustainable development of member states in particular and Africa in general, through the development of critical capacity for timely delivery and responsible use of appropriate geospatial information. The objectives of the Centre (as revised in July 2002) are:

- to 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 management, mapping, natural resources, etc;
- to 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;
- to carry out studies and research in the field of Geoinformatics; and
- to provide advisory and consultancy services in Geoinformatics and other related areas to the governments of the member states of the Economic Commission for Africa and other institutions at large and to charge fees for such services as may be determined by the Governing Council of the Centre.

In this presentation the strategies and synergy of accomplishing the objectives, vision and mission of the Centre as well as prospects of collaborative research are discussed.

## CONCEPTUAL FRAMEWORK

The capacity development of Geoinformation science experts (and by implication, the adoption of Geoinformatics technology) for mapping and geospatial analysis and production in Africa is examined under the concepts of 'Geoinformatics professionalism and innovation diffusion in Africa'. The geographic scale of Geoinformatics professionalism and innovation diffusion can be global, regional, national or local.

The inadequacy of manpower needs in the mapping sciences in Third World countries has been highlighted by Ihemadu, 1987 and 1992; Ikhuoria, 1995 and Ayeni, 1996. According to Akubue (1988) a profession is a calling requiring specialised intellectual and exclusive knowledge and training, including instructions in skills and methods. The three general distinguishing characteristics or dimensions of a profession are:

- the cognitive dimension, centred on the body of knowledge and period of training necessary to master such knowledge and skill, and activities that are intellectual.
- The normative dimension, which refers to the service orientation of professionals and the distinctive code of ethics that justifies the privilege of self-regulation, granted them by society.
- the evaluative dimension, which implicitly compares a profession to other occupations. This underscores the profession's singular characteristic of autonomy and prestige.

Ikhuoria (1999) has discussed the three levels of professionalism and training with commensurate qualifications recognised by public and private sectors of the economy in West Africa. In Anglophone countries (with specific Nigerian examples) they are:

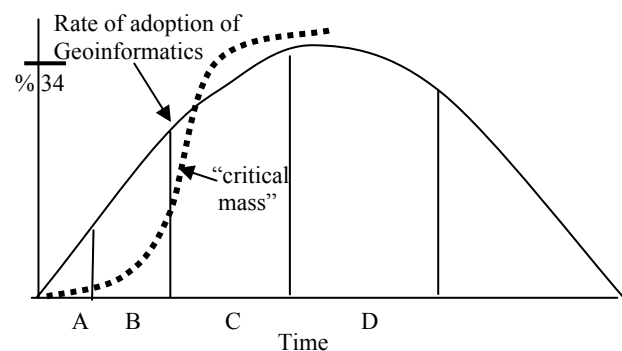
- Technical: technicians who acquired training of three months to two years in post secondary institutions; in-house training and private apprenticeship, and who possess either the West African School Certificate, the City and Guilds certificate, or a Technical college or Polytechnic National Diploma (ND) in a field. The subjects occupy grade levels 04 to 09 in the Nigerian civil service.
- Technological: technologist who acquired education and training in theoretical concepts and practical skills for a period of two to three years in a polytechnic or equivalent institution, and who possess the Higher National Diploma (HND) in a field or discipline. The subjects may occupy grade levels 07 to 13 in the civil service but seldom participate in management and policy decisions.
- Professional: university graduates in any discipline. The subjects rise from the lowest position of grade level 08 to the highest grade level 17, and are involved in management and policy decisions.

As Ikhuoria (1999) had shown, it was the acute shortage of manpower in all the three levels of professional training that had necessitated UN-ECA to foster the establishment of five regional Geoinformatics training and user assistance centres in Nairobi, Kenya; Kinshasa, Zaire; Ouagadougou, Burkina; Cairo, Egypt; and Ile-Ife, Nigeria. Notwithstanding criticisms of the effectiveness of the success of these centres to meet their objectives, RECTAS' role and functionality is discussed in this paper.

A spatial model, Hagerstrand (1967) hierarchical model of innovation diffusion, is used to examine RECTAS' capacity building and adoption of Geoinformatics in Africa. The model postulates that adoption will begin in the larger centres/organisations and subsequently diffuse to smaller

centres/organisations. Large centres are more open to the outside world because of their size and functions and so they are pioneers. A second spatial model, *the core-periphery model* (Craglia and Masser, 1996) is again applicable to Geoinformatics adoption because like the hierarchical model it assumes that adoption of Geoinformatics will begin in the core cities or regions due to their size and links to the outside world before spreading to the peripheral cities, regions and local areas that are less cosmopolitan in character and have fewer resources at their disposal.

Rogers (1993) has showed that the diffusion of a technological innovation, such as Geoinformatics, typically follows an S-shape or logistic curve (Fig. 1). This implies that the initial rate of adoption is likely to be relatively slow until a critical mass of users is achieved after which the rate of adoption increases rapidly in a near vertical curve until a saturation level is reached when the curve tapers off to a horizontal axis (Craglia and Masser, 1996; Ramasubramanian, 1999).



where: A= innovators (venturesome, 2.5%);  
 B= Early adopters (respectable, 13.5%)  
 C= Early majority (deliberate, 34%);  
 D= Late majority (skeptical 34%);  
 E= Laggards (traditional, 16%).

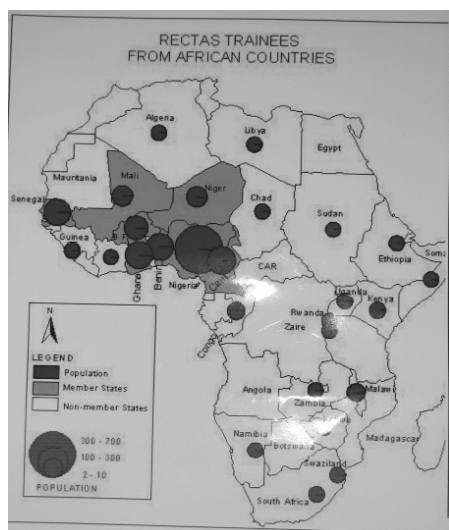
Fig. 1: Diffusion of innovations (adapted from Rogers, 1993)

## EVOLUTION OF CRITICAL CAPACITY DEVELOPMENT AT RECTAS

Since the commencement of its activities in 1973, the evolution of RECTAS has been closely associated with the International Institute for Geoinformation Science and Earth Observation (ITC) in Enschede, Netherlands. The first Director, Prof. H. C. Zorn, photogrammetric instruments, lecture materials, etc, were provided by ITC. In fact, all the activities and programmes were tailored after those offered at ITC. The evolution of academic programmes can be categorised into four phases: (i) Technical training (1973-1985) (ii) Technological Professionalism (1986-2000) (iii) Professional training (2001-2009), (iv) Academic professionalism and Research advancement (2010-).

A total of 1,522 trainees from 28 countries have been educated and trained at RECTAS between 1973 and 2010. The current enrolment is 82 students and it consists of 40% Francophone and 60% Anglophone; made up of 22% technician, 14% technologist and 64% postgraduate students (Fig. 2).

The current staff structure of RECTAS consists of a total of 72 personnel made up of 24 professional staff and 48 general service staff. The details of the each evolution phase are discussed as follows:



### Phase 1: Technical Training

The technical training started in 1973 with the admission of 11 trainees into the technician's course in photogrammetry and 5 trainees in a six months operator's course in photogrammetry, respectively. The two programmes were run simultaneously until 1985 and a total of 262 trainees were produced. The landmark of this phase is the introduction of a course in photo interpretation in 1983 with the enrolment of 19 trainees. The staff consisted of mainly photogrammetric technicians and technologists. During the period 4 Directors: Prof. H. C. Zorn (1973-1974), Mr J. O. Daramola (1974-1975), Mr B. O. Okuwa (1975-1976), and Dr S. O. Ihemadu (1976-1984) administered the Centre. Apart from Zorn who was seconded from ITC, other Directors were career surveyors and civil servants. All of them had only mundane academic training perspectives for the Centre.

### Phase 2: Technological Training (1986-2000)

This is the expansion phase lead by Professor Olubodon O. Ayeni, PhD product of Ohio State University, USA. At the time of his appointment he was an academic scholar and Professor at the University of Lagos, Nigeria. His tenure (1985-1991) witnessed the first *strategy* to academise the Centre with the introduction of the technologist diploma course in photogrammetry in 1986 and the commencement of two postgraduate diploma courses in photogrammetry and remote sensing in 1989. The photo interpretation was phased out in 1990 while the technician and technologist diploma courses in remote sensing were introduced in 1990 and 1991, respectively. A synergy with reputable academics and professionals within and outside Nigeria was used to develop the curriculum contents for the programmes and a recruitment of professional staff with a minimum of master degrees in relevant fields. Furthermore, synergy and collaborative support of Britain, Swiss, French and Dutch governments as well as UNDP and European Union were obtained for students' fellowships and laboratory infrastructure (Table 1).

Prof Ayeni was succeeded by Mr J. A. Ogunlami who was a career surveyor and civil servant. During his tenure (1991-2000) the academic momentum was rather stagnated. The operator's course in photogrammetry stopped in 1994. At this stage, the efforts to fully implement the EEC/RECTAS/ITC/GDTA

project (1990-1994) may have had some hiccups. According to some staffs' account the implementation, under the supervision of ITC coordinators, was rather an unfulfilled project. The land mark that characterised the era of the phase is the employment of senior academic professionals with MSc and PhD degrees and short course *capacity building* of RECTAS staff at ITC in Netherlands and GDTA in France to enable them carry out their teaching functions effectively. During the phase a total of 669 trainees graduated in photogrammetry and remote fields.

**Table 1: Technical Co-operation attracted by Prof. O. O. Ayeni, 1985-1991**

A	British Council Fellow (1985-1991) - 14 student fellowship for Malawian nationals
B	Swiss Government Co-operation (1985-1991) - 82 student fellowships for 8 African countries apart from donation of APY equipment
C	United Nations Development Programme UNDP Regional Assistance (1988 – 1992) - Provision of \$300,000.00 for equipment and scholarship for postgraduate students from African countries
D	French Government Co-operation, GDTA-RECTAS Project (1988-1992) Provision of \$2million for: - remote sensing equipment and software - 2 computers - 3 staff training for M.Phil in France - 10 staff training for short courses - Secondment of French experts to RECTAS
E	European Union Technical Assistance, EEC/RECTAS/ITC/GDTA Project (1990-1994) Provision of \$5.7million as follows: (i) European Community - US\$3.7million (ii) French Government - US\$1.5million (iii) Dutch Government - US\$0.5million Total - US\$5.7million To be utilised for the development of Cartography, Remote Sensing and Photogrammetry at RECTAS through a tripartite relation with ITC, Holland and GDTA, France for the following: - Modern equipment for Cartography, Remote Sensing and Photogrammetry with computers. - 40 students fellowships per year. - New Curriculum Development for Cartography and revision of other courses and staff development.
	European Union Lagos Fellowships (1991) 6 EC local student fellowship awards for Nigerian students amounting to ₦150,000.00

Source: Ayeni, 2010

### Phase 3: Technological Professionalism (2001 - 2009)

This phase of technological and professional training was husbanded by Dr Jide Kufoniye as Executive Director. An intellectual scholar and PhD product of ITC, Kufoniye used his intellectualism, leadership and management experience as Rector of School of Surveying, Oyo to consolidate and advance the Centres' academic activities. During the phase the course programmes in the fields of photogrammetry and remote sensing were stopped. A unified course programme in Geoinformation production and management was adopted. The new programme was tailored after the counterpart offered at ITC at the technician (18months), technologist (18months) and postgraduate (12months) diploma levels. Admission into the technician and technologist courses were made in every odd

year with commencement in March while admission to the postgraduate course is yearly and commences on September 1<sup>st</sup>.

All course materials, software and quality control requirements were provided by ITC. Under the synergy of collaboration, RECTAS staffs were sent on short courses at ITC for knowledge and skills capacity upgrading to enable them disseminate the programme contents to trainees. The strategic framework of the technological professionalism phase was characterised by the following quasi-ventures:

- *Joint ITC-RECTAS education programme collaboration*
- *RECTAS-Dept of Geography, Obafemi Awolowo University programme*
- *RECTAS-Faculty of Environmental Management, Obafemi Awolowo University collaboration*
- *CAMES accreditation*

**Joint ITC-RECTAS education programme collaboration:** The Joint ITC-RECTAS education programme collaboration consisted of:

- Postgraduate diploma course with duration of 12 months awarded by RECTAS accompanied by ITC logo. Although RECTAS had run its own independent PGD for 26 years, the PGD became part of the joint ITC-RECTAS programme in September 2004. Nine (9) modules of the RECTAS PGD were replaced nine (9) of the ITC M.Sc. modules;
- Master of Science (MSc) course with duration of 18 months (9 months at RECTAS and 9 months at ITC). The degree is awarded by ITC with joint ITC and RECTAS logos;
- Short-term refresher courses taking advantage of modular design of ITC-RECTAS courses.

The joint ITC-RECTAS education initiative might have been part of ITC's global business plan. It seems ITC's strategy was to reduce the cost of training Third World students at the technician and technologist levels in the Netherlands and focus its resources on higher academic professionalism and research programmes at the MSc and PhD levels. Thus, the programmes at RECTAS and elsewhere became harvest grounds for best candidates for the MSc and PhD programmes at ITC. The business plan was, unfortunately, not quite successful at RECTAS.

According to Table 2, ten (10) students were nominated for the ITC-RECTAS MSc programme in 2004-2007 academic sessions. Of these only 4 students (40%) successfully completed and obtained the MSc degree. The failure of others was attributed by ITC to poor English language proficiency and research skills. A critical examination, however, revealed that the ITC strategy and business plan was poorly marketed. The *niche* is "a very good student normally won't seek admission into a PGD programme as inroad to an MSc degree). Thus, it would have been better to market the programme as a "Professional Masters" degree at RECTAS. In the 2008/2009 session 5 very good students who scored >76% average in 9 modular courses were nominated for the MSc programme. Perhaps, However, ITC had realised that its business plan was failing (apart from the supposed academic quality of the students, none sponsored himself without a Dutch fellowship). Thus, from a business-economic point of view, a kangaroo review of the programme was hurriedly made and ITC terminated the agreement without examining the options that would have improved the academic situation at RECTAS and the students. The irony is that the first and third ITC PhDs and several MSc were obtained by candidates from the same

Nigerian and other West African cultural and educational backgrounds.

Table 2: Academic Success of RECTAS/ITC MSc Programme

Session	Students	Academic Achievement at ITC				
		PGD	Prof. Masters	Incomplete	M.Sc	%
2004/2005	5	1	3	1	-	0
2005/2006	3	-	-	1	2	67
2006/2007	2	-	-	-	2	100
2007/2008	-	-	-	-	-	-
Total	10	1	3	2	4	40

**RECTAS-Dept of Geography, Obafemi Awolowo University Programme:** The RECTAS-Department of Geography, Obafemi Awolowo University synergy is a quasi-collaboration since 2004 whereby the students of the Department are given three weeks practical training in remote sensing and GIS techniques at RECTAS laboratory each semester. RECTAS is not in control of the admission process and quality control policies of the Department and School of Postgraduate Studies. The University merely remunerates RECTAS for its services. However, the programme has been very successful with an average of 15-20 student attendees each session.

**RECTAS-Faculty of Environmental Management, Obafemi Awolowo University collaboration:** This is another quasi-arrangement which is yet to commence.

**CAMES accreditation:** Although RECTAS academic programmes are nearly four decades old, none of them was accredited. The programmes have been based on value-recognition by the government agencies that sponsor the trainees and the Centre's relation with ITC as well as the auspices of UN-ECA. But such recognition is not enough or suitable for trainees to further their studies or seek gainful employment in many other agencies and institutions other than the ones that sponsored them. The second problem was that the duration of the technician and technologist courses of 12 months was not in conformity with the recognised standard period of professionalism and training with commensurate qualifications recognised by public and private sectors of the economy in Africa. This situation became critical in Francophone countries hence they advised RECTAS to adjust the duration to a minimum of 18 months and to obtain the necessary Conseil Africain et Malgache pour l'Enseignement Superieur (CAMES) accreditation. Dr Kufoniyi took the initiative and explored CAMES accreditation for the technologist and postgraduate diploma programmes in 2007. In 2009 Kufoniyi's successor, Prof. Isi Ikhuria, on the approval of the Governing Council, facilitated the accreditation process by restructuring RECTAS from a polytechnic to a university academic system. The accreditation of Anglophone bodies is now being processed.

The other landmarks of this phase are the complete change from analogue to digital training techniques, extensive execution of consultancy projects, synergic links with ECA, ISPRS, ESRI, CODIST, AFREF, AARSE, etc. However, as pointed out by the ITC review team, the strength of academic personnel, research and mode of programme execution were rather shallow. But, again, the irony is that ITC had constantly been on the co-pilot's seat.

#### Phase 4: Academic Professionalism and Research Advancement (2010 - )

Ikhuria (2009) made it clear that *the critical mass of Geo-information experts and scientists needed for Africa's development cannot be satisfied with piece-meal training of very few students at ITC or elsewhere whose graduation is even constrained by sundry issues*. While the approach will continue to be explored to develop and upgrade significant personnel, a paradigm shift to indigenous content and environment is highly imperative. The situation of academic professionalism and research advancement in Geoinformation science in Africa is now similar to that of United Kingdom and Europe in the 1980s. The problem was recognised in the Chorley report of 1987 which concluded that there was a "need to increase substantially, and at all levels, the provision of trained personnel" to meet the demand for higher education in Geoinformatics in the United Kingdom (Cassettari, 1991).

Professor Isi Ikhuria is an ITC technologist alumnus (1974), had obtained BSc at George Washington University, DC, (1977) and MA at University of California, Santa Barbara (1981), USA; then returned home for a PhD at University of Benin, Benin City, Nigeria (1990) and rose to the rank of professor. On appointment at RECTAS on 1<sup>st</sup> September, 2008, he envisioned the following:

- *strategic Plan for RECTAS.*
- *linkages and partnership relationships with international and local institutions.*
- *geospatial data infrastructure significance and relevance in Africa.*
- *scientific research and intellectualism innovating cutting-edge developments in the frontiers of geo-information science.*

Consequently, RECTAS' strategy for phase 4: Academic professionalism and research advancement is to:

- consolidate the existing technical and technological professionalism programmes.
- upgrade the academic Units to Departments (Photogrammetry and Remote Sensing; Geographic Information Systems; and Cartography). Each Department would be headed by a Professor.
- commence higher degree programmes (MSc in 2010) in Photogrammetry and Remote Sensing, GIS and Disaster Management, and Cartography and Land Administration; and PhD in 2012 in Geoinformation Science in collaboration with universities in Africa and elsewhere.
- continue to upgrade the infrastructural facilities to meet international standards.
- invigorate academic research activities with focus on environmental management, climate change and food security.
- Review the master plan and infuse a strategic plan.

In this regard, synergic linkage and collaboration (under memoranda of understanding) for academic training and quality control is being established with accredited tertiary institutions such as Federal University of Technology, Akure, and University of Benin, Benin City in Nigeria; University of Abomey-Calavi, Benin Republic; University Cheick Anta Diop, Senegal; and others in USA and UK. Similarly, joint research projects and funding is being sought with local and international groups (such as GARNET-E, UN-SPIDER, GSDI, SMART, EIS-Africa, AAG, etc).

#### DISCUSSION

An evaluation of RECTAS development under the concept of technological innovation diffusion shows that it is still at the foot of the 'S' curve because the attainment of the *critical mass* of Geoinformatic experts has not even started. There are potentials for the engagement of the critical mass of experts in Africa. Among the areas they can be employed are storage and retrieval of data, natural resource based applications, geopolitical, land parcel-based applications, facilities management applications, cartographic applications, health/epidemiology applications, military and criminology applications and marketing.

Similarly, a list of the public and private establishments in Africa where the services of Geoinformation experts are required is inexhaustible. In Nigeria, there are over 220 tertiary institutions where the diffusion of Geoinformatics services and training of students are highly necessary. Rogers 1993, has explained the diffusion of GIS innovations to the local government levels in Europe. The process is also feasible in Africa. For example, Nigeria has 36 States and 774 Local Government Councils. A hypothetical employment of at least one pair of Geoinformatics expert and technician/technologist in at least 3 state agencies; and one pair in each Council imply that a mass of 1,626 Geoinformatics professionals would be employed in Nigeria alone. According to Rogers, 1993, this figure would only represent the innovators and early adopter at 16% of prospective users scale.

In reality, there is now an emergence of greater recognition of the value of Geoinformatics in the region. The following are typical examples:

- **AGIS:** In order to manage the land administration process in Abuja, Nigeria the Abuja Geographic Information Systems (AGIS) was established in October, 2003. AGIS subsequently proved to be a successful cadastral land title registration agency using GIS tools. With an investment of \$2 million dollars, it now generates over \$21 million dollars annually. The Geoinformatics professional personnel are over 100.
- **Ondo State:** In 2004, Ondo State government commissioned RECTAS to produce the topographic maps of the state at the scale of 1:25,000 with IKONOS satellite imagery. It also acquired Quickbird imagery of the entire state in 2008. In March, 2010, the government convened a consortium of five Geoinformation consultants (including RECTAS) to advise the Governor on the best practice and cost effective procedure for a land cadastre and title registration. The application of GIS and high resolution satellite imagery was adopted. The need for a Geoinformatics policy and web-based Geo-database; and capacity building for stake holders, professionals and technologist/technicians at both short and long term course programmes was adopted. Among other things, RECTAS will be involved in GIS capacity building for personnel of ministries of health, lands and housing, physical planning and urban development, natural resources, agriculture and water corporation.
- **Lagos State:** In 2008, the government of Lagos State established a digital mapping and GIS project which has resulted in a web-based *Enterprise GIS* with application in land administration. The project includes Bathymetric charting of the lagoons and web mapping and establishment of a continuous Operating Reference Station (ORS). The outstanding success is giving impetus to other state governments to adopt the initiative.

- **Nassarawa State:** In 2008-9 Nassarawa State adopted the application of Geoinformatics and digital orthophotography to map its territory at the scale of 1:25,000 and in its 2010 budget, it has made plan for the application of GIS in its land administration.
- **Land Reform:** In 2009, the Federal Government of Nigeria embarked on a land reform programme designed to empower every citizen with titles to landed property. For its implementation the application of Geoinformatics I identification of land and cadastre mapping with orthophotography and Geospatial database were recommended. RECTAS is leading seven other institutions to train over 2000 para-geomatics that will be deployed for the fieldwork exercise.
- **Edo State:** In the fourth quarter of 2009, Edo State government advertised for reputable companies to bid to implement its web-based Geo-database, mapping and e-governance development programmes.
- **NFIS:** With the financial support of **FAO**, the Forestry Department is set to implement a web-based National Forest Information System Geo-database (NFIS) in 2010. At a stakeholders' workshop in 2009 the decision to implement the NFIS was taken along with recommendations for capacity building for stake holders, professionals and technologist/technicians.
- **NASRDA:** The National Space Research and Development Agency of Nigeria had already has an operational 32m resolution satellite. It has planned to launch a 2.5m high resolution satellite by the forth quarter of 2010 which will revolutionalise geospatial data provision and application in Africa. NASRDA employs more 100 geoinformatics scientific officers.
- **ECOWAS:** In February, 2010, the Economic Commission of West African States (ECOWAS) convened a meeting of heads of mapping agencies in West Africa and RECTAS to deliberate on the status of mapping and geoinformation products in the sub-region. The general finding was that the status was grossly inadequate. A five nation committee (Nigeria, Senegal, Cote de Voir, Benin and Cape Verde) under the co-ordination of RECTAS was established to recommend the necessary protocols for improving the geoinformation status of countries in the sub-region.
- **RESEARCH:** A synergy of collaborative linkage and research has begun. RECTAS will benefit with a 50,000 Euro in its research collaboration with the GARNET-E (17 member consortium research group) research programme in Africa which starts on 1<sup>st</sup> May 2010. Also, RECTAS is involved in a marine pollution research project (IAEA-FGN, RAF/7/2008) with Professor Sikoki of the University of Port Harcourt. In addition, RECTAS has contributed to the Global Dialogues for Emerging Science & Technology Africa (GDEST) at the American Association of Geographers conference. RECTAS hopes to be recognised and selected for the US State Department's funded collaborative research on the theme "Geospatial science for Sustainable Development in Africa" In this regard, partnerships, linkages and network with American universities and research institutions will be very helpful to foster RECTAS' research goals.

## CONCLUSION

The paper has examined and discussed the vision, mission and objectives of RECTAS and the strategies and synergy of accomplishing them in the four phases of its evolution. It is clear from the analysis and discussion that RECTAS is poised, with greater zeal in its forth phase, to fulfil its vision of being a

leading *centre of excellence* for quality geospatial science education and critical capacity training; and mission to contribute to rapid sustainable development of Africa. The strategies and synergies of accomplishing the objectives are in conformity with conceptual and theoretical spatial models of technological innovation diffusion. In this regard, programmes for higher degrees (MSc and PhD) and research projects in collaboration with local and international institutions will be commenced.

The physical infrastructure of the Centre, roads, water, energy, classrooms, buildings, hostels and staff accommodation need to be upgraded to accommodate the Phase 4 strategy. The infusion of funds by the government of Nigeria in its 2010 capital budget as well as the contributions of member states to fulfil the objectives and strategies is highly appreciated.

## REFERENCES

- Akubue, A., 1998: Professionalism of teaching in Nigeria: Fact or fiction. *Education Today*, Vol. 1, No. 3, pp. 29-41.
- Ayeni, O. O 2010: Personal Communication
- Ayeni, O. O., 1996: Digital mapping and GIS education in developing countries. *International Archives of Photogrammetry and Remote Sensing*, Vol. XXXI, part B6, Vienna, pp. 1-6.
- Craglia, M., and Masser, I., 1996: Introduction, in Masser, I., Campbell, H. and Craglia, M. (eds), *GIS diffusion – The adoption of geographical information systems in Local Governments in Europe*, Taylor and Francis, London.
- Cassettari, S. 1991: Geographic Information Systems at Kingston. *The Cartographic Journal*, Vol. 28, June, pp. 71-75
- Hagarstrand, T., 1967: *Innovation diffusion as a spatial process*, University of Chicago Press, Chicago.
- Ihemadu, S. O., 1987: The problems and prospects of remote sensing applications in developing countries. *ITC Journal*, No. 4, pp. 284-291.
- Ihemadu, S. O., 1992: Remote sensing applications in developing countries: a review. Seminar paper, Regional Centre of Training in Aerospace Surveys (RECTAS), Ile-Ife.
- Ikhuoria, Isi A., 1995: A study of the academic status of cartography and GIS in Nigeria. *Cartographica*, Vol. 32, No. 4, pp. 43-54.
- Ikhuoria, Isi A. 1999: "Professionalism and manpower issues in GIS in West Africa" *Transactions in GIS*, Vol. 3, No. 4, pp. 343-358.
- Ikhuoria, Isi A., 2009: Communication with ITC Review Team.
- Ramasubramanian, L., 1999: GIS implementation in developing countries: Learning from organisational theory and reflective practice, *Transactions in GIS*, 3 (4), 359-380.
- Rogers, E. M., 1993: The diffusion of innovations model, in Masser, I., and Onshrud, H. J., (eds.), *Diffusion and Use of Geographic Information Technologies*, Dordrecht, Kluwer, pp. 9-24