

# Surveying: Academic and Professional Discipline (11705)

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**Key words:** Budding, Challenges, Post primary, Professional

## 1. SUMMARY

Over the years the number of Surveying and Geoinformatics graduates as compared to others within the built environment has been an issue of concern. Many post primary school leavers lack the basic information of Institution offering Surveying and Geoinformatics programmes in Nigeria, such as its entry requirement, how to go about becoming a professional Surveyor as well as the opportunities accruable to a graduate surveyor. This had made them have wrong perception and unnecessary doubts for the profession. The Nigerian educational system offers every academic discipline the basic preparation for budding professionals i.e. training, research disseminating new and existing information, pursuit of services to the community and being a storehouse of knowledge. Aseogwu (1994) state that the future of any profession depends on the ability of the training programme for the new entrants to face challenges of the future. This assertion holds true with regard to surveying, the bedrock of any meaningful and sustainable development. The Surveyor's service is required from acquisition (Perimeter survey) and completion stage (As-built survey). The question is how can a school leaver join the Surveying Community? This paper tends to present the required basic background of the Surveying training in Nigeria as Academic and Professional discipline.

**Słowa kluczowe:** Budding, Wyzwania, Post primary, Professional

## 2. SUMMARY (Polish)

Z biegiem lat liczba absolwentów geodezji i geoinformatyki w porównaniu z innymi w środowisku zabudowanym była przedmiotem troski. Wielu absolwentom szkół ponadpodstawowych brakuje podstawowych informacji o instytucji oferującej programy geodezyjne i geoinformatyczne w Nigerii, takich jak wymóg wejścia, jak zostać profesjonalnym geodetą, a także możliwości przysługujące absolwentowi geodetów. Nigeryjski system edukacyjny oferuje każdej dyscyplinie akademickiej podstawowe przygotowanie dla początkujących profesjonalistów, tj. Szkolenia, badania rozpowszechniające nowe i istniejące informacje, dążenie do usług dla społeczności i bycie magazynem wiedzy. Aseogwu (1994) stwierdza, że przyszłość każdego zawodu zależy od zdolności programu szkoleniowego dla nowych uczestników do stawienia czoła wyzwaniom przyszłości. To twierdzenie jest prawdziwe w odniesieniu do geodezji, podstawy każdego znaczącego i zrównoważonego rozwoju. Usługa Geodety jest wymagana od etapu nabycia (badanie obwodowe) i etapu ukończenia (badanie powykonawcze). Pytanie brzmi, w jaki sposób absolwent szkoły może dołączyć do społeczności geodezyjnej? Ten artykuł ma tendencję do przedstawiania wymaganego podstawowego tła szkolenia geodezyjnego w Nigerii jako dyscypliny akademickiej i zawodowej.

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## 1.1 Introduction

Surveying and mapping has recently undergone a transition from discipline oriented technologies, such as Cadastral surveying, Geodesy, Hydrography, Photogrammetry and cartography into a methodology oriented integrated discipline of geo-information based on GPS positioning, Remote sensing, Digital photography, Hydrography, Computing and GIS for data manipulation and data output (Konnecy 2003). Nigeria as the most populous country in Africa and one of the most populous in the world is a potentially huge market for surveying services. However, the Surveying profession in Nigeria appears to be witnessing a gradual but steady decline in the quantity of people practicing it (Ayeni, 1982). Up till the present date Surveyors in Nigeria “dead and alive” are less than 5,000 to cater for the needs of Survey services and products for a huge population of over 120 million inhabitants. Secondary School leavers have been abandoning the profession as they are not motivated to enrol for the course in higher educational institutions. Not many youths are eager to enrol for surveying as a first choice course in tertiary educational institutions and a lot of surveying professionals in the country are not fulfilled (Fajemirokun, Nwilo & Badejo, 2002). Notwithstanding this ugly scenario, the surveying profession possess the potentials to compete with other professions in the nearest future in terms of population and popularity. The aforesaid indeed necessitated the vexed supposed training of Quasi Surveyors or Para-surveyors to augment the number needed for field data capturing for the National Land Reform.

## 1.2 What is surveying?

In a generic term Surveying can be described as the arts of science of taking measurement of features on the earth surface to determine their position, shape, size, location, quantities, value/ cost, etc and the representation of such in plans, maps, charts, bills of quantities for the purposes of planning, construction, development as well as conveyances. This definition is in consonance with the dictates of the International Federation of Surveyors (FIG). The Surveyors Council of Nigeria, established by CAP 425 Laws of the Federation, 1990 Surveying means the art or science of measuring, determining, depicting, or representing the dimensions, extent, features or relative positions of the earth’s Surface. This information is usually represented in a plan, map, and charts using conventional signs and symbols for easy interpretation, planning and development (Surcon, 1989).

## 2.1 Brief history of Surveying

Surveying is one of the oldest professions on the surface of the earth. It has been practiced both as an act and science, several hundreds of years before the birth of Christ. Historical references showed that the boundary of Egypt were divided into plots for taxation purposes using beacons, but when the annual floods on the River Nile swept away portions of these plots, Surveyors then called “rope-stretchers” were called upon to replace them. This led the early Greek philosophers to develop the science of geometry. Today modern surveying involves Geomatics. It deals with digital applications involving his capturing, processing, analysis, retrieval, presentation and management of Geo-spatial information.

## 2.2 History of Surveying in Nigeria

The nature of the colonial education systems practiced in both the England and France left behind a great legacy in Africa’s surveying and mapping sector. The educational policy was to train as many Africans as the government considered necessary to supply middle-level manpower in administration and the schools (Udo, 1982). The first set of surveyors then were from the Royal Navy and Royal Engineering Corps of the United Kingdom. They came from Lagos, to undertake Route Survey for Nigerian Railways. Hence the inclement climatic conditions and the high mortality rate of the

foreigners, it became necessary to train Nigerians as Surveyors (Kukoyi, 1984). Since the commencement of the railways in 1839, various means of training Nigerian Surveyors were devised. Some were sent abroad to be qualified as Civil Engineers such as Late Herbert Macaulay while others were trained locally (Atilola, 2010). Consequently, to meet the exigency of Surveying and mapping of the country, it became extremely necessary to commence surveying training locally. In 1908 the first post secondary school which was also a survey school was established in Lagos, Nigeria. The ideal of the founders the aforesaid school was that of a “local university” for the youths of the country for one reason or the other unable to travel overseas for further training (Coker, 1984).

The school had a temporary shutdown during the world war and later reopened in 1925. In 1929 the school was transferred to Ibadan for the need of larger space for practical work and finally to Oyo in 1935. Similarly, the Yaba Higher College was established to train Nigerians in other fields of study. Consequently, the survey programme was later integrated into the new college programme. In 1946 the Elliot Commission Report on Higher Education for Colonies, gave birth to the University College (now University of Ibadan) which was established in 1948 with Yaba Higher College students forming its nucleus. The Survey school, Oyo was closed down and a new school of surveying was created as an integral part of the University College, Ibadan. This Surveyors training programme was short-lived, as a result of this policy reversal and the then Directorate of Colonial Surveys to take over the survey activities in Nigeria, the School of Surveying of the University College, Ibadan was scrapped in 1950 and replaced with an “on-the-job training” scheme. Between 1950 and 1952 (mentor and mentee training scheme) was later replaced with Survey school for Technicians at various places - Eke (near Enugu), Kaduna and finally at Oyo (Kukoyi, 1984).

### **2.3 Development of surveying education in Nigeria**

Surveying education in Nigeria is now offered at three levels, namely technical, technological and professional. Formal training at these three levels is handled in polytechnics and Colleges of Technology, and the Universities. These trainings at various institutions lead to qualifications such as the National Diploma (ND), Higher National Diploma (HND), and Undergraduate degree (Bachelor Sc/Tech), Other (Post Graduate Diploma and Professional Diploma) and Doctoral Degree. Some low level manpower is also produced through informal, apprenticeship training (NIS, 2013).

#### **2.3.1 Professional Training in Nigerian Universities**

In 1956 the Nigerian College of Arts, Science and Technology now University of Nigeria, Enugu started a four-year Programme in surveying. The programme prepared students for the “first” and “intermediate” examinations of the Royal Institution of Chartered Surveyors (RICS). Successful students had to go to Britain to complete their professional training (NIS, 2013). In 1962, the College of Technology, Enugu was integrated into the University of Nigeria, Nsukka, which was established in 1960. A department in surveying was created, thus restoring the local training of surveyors in Nigeria at universities level. The first set of five graduates trained in surveying Graduated in 1966 (Fajemirokun, 1983). Since then the Facilities for the training of surveyors have developed tremendously. The Department of Surveying and Geoinformatics of the University of Lagos started as a sub-department of Civil Engineering Department in 1970. The initial programme of the sub-department at the time was a two-year postgraduate course of study and research leading to Masters degree (Surveying) that can also prelude a Doctoral degree (in any choice field of Surveying and Geoinformatics).

Graduates in fields cognate to Surveying were admitted into the programme. Prior to this period, the Faculty of Engineering of the University of Lagos in 1967 arranged for a few surveying undergraduate of the University of Nigeria, Enugu Campus who were Displaced by the prevailing Civil War to complete their degree programmes in the Faculty and to earn a degree of the university. In 1974/1975 academic session, the department started its bachelor degree programme. The Department of Surveying,

Ahmadu Bello University, Zaria was set up at about the same time that the University of Lagos started offering surveying at postgraduate level, and has graduated students at all levels of Surveying. For decades, these three departments were the Nigerian universities departments training surveyors at the professional level (NIS, 2013; Surcon, 2019). However, over the past two or three decades, many other universities have established department for the training of surveyors at the professional level. At present, at least eleven universities have well developed programmes of studies leading to postgraduates' degrees including the Ph.D (Surcon, 2019; Surcon, 2021).

### **2.3.2 Technical and Technological Education**

Till late 1960s the school of Surveying, Oyo was the only tertiary institution training surveyors at the technician and technologist levels. Currently a total of thirty five (35) institutions, including the Federal School of Surveying, Oyo, train technicians and technologist in Surveying and Geomatics in the country. In Nigeria, the National Board for Technical Education (NBTE) approved curricula are used by all polytechnics and similar institutions to train survey technicians and technologist. Thus, Colleges of Technology and Polytechnics are responsible for the training of Technicians (ND Certificate Holders) and Technologist (HND Certificate Holders) on production work and technical management for direct employment in industry and public service Nigeria (Fajamirokun, 2008). The Federal School of Surveying, Oyo, apart from running courses leading to ND and HND qualifications in Surveying and also runs other courses, including the full Professional Diploma course which is recognized by SURCON as an equivalent qualification acceptable for registration at the professional graduate level. Other courses introduced as far back as 1998 include the Pre-Professional Diploma in Surveying and Geoinformatics and the Postgraduate Diploma (PGD) in Geographic Information System. The structure of the ND consists of four semesters of classroom, laboratory and workshop activities in the institutions, and a semester of three to four months' duration of supervised industrial training. The structure of the HND programme is similar to that of the ND except that the SIWES is not compulsory.

## **2.4 Academic requirements for Surveying and Geoinformatics admission**

### **2.4.1 Entry requirements for Nigerian Universities**

The minimum entry requirement for the first degree surveying is the successful completion of the universal basic education system with credit passes in at least five subjects which must include mathematics and physics and at least a pass level in English language is also stipulated.

The prospective candidate for surveying discipline are encouraged to study in addition the following subjects in their secondary education careers, chemistry, technical drawing, land surveying, and geography. It should be noted however that secondary schools are yet to start offering land surveying as a subject. Other possible entrants are holders of advanced level passes in mathematics and physics in addition to at least three ordinary level papers. This group and holders of ND, upper credit level in land surveying plus the ordinary level passes a stipulated for universal basic education entrants are admissible into the second year of the first degree programme.

#### **2.4.1.1 Bachelor Degree programme**

It is worth mentioning that, presently candidates seeking admission into any higher institution in Nigeria are required to pass the cut off mark of the Unified Tertiary Matriculation Examination (UTME) examination and the Post UTME test conducted by individual Institutions. The UTME and Post UTME test subjects for Surveying and Geomatics are Mathematics, Physics, English, Geography or Chemistry/ Further Mathematics (i.e. Geomatics Engineering). It should be noted that the new minimum standard for entry into the first degree programme in surveying does not encourage HND holders to seek admission into the programme. The HND in surveying is a terminal course which is designed to solve a special manpower need in surveying. It is the view here that admitting the HND holders into the first degree programmes is a waste of training resources. However, the few exceptionally brilliant HND holders should seek for higher degrees through a well-structured post-

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graduate diploma programme. It is hoped that this avenue for the enhancement of the higher education quest for deserving HND holders will be taken care of when the minimum standards for post-graduate degrees and diplomas will be worked out by the National Board of Technical Education (NBTE) and Nigerian University Commission (NUC).

## **2.4.2 Entry requirements for Nigerian Monotechnics/ Polytechnics**

### **2.4.2.1 National Diploma Programme**

Applicants with the following qualifications may be considered for admission into the National Diploma Programme by direct entry: senior school certificate examination (SSCE) or its equivalents with credit passes in Mathematics and Physics and any other two subjects from the following: Statistics, Further Mathematics, Chemistry, Technical Drawing, Basic Surveying, Geography, Economics, Biology/ Agricultural Science and at least a pass in English language at not more than two sittings. Four credit passes in relevant subjects as stated in (i) above obtained at the final examination of the NBTE recognized preliminary ND programme offered in Polytechnic or post-secondary/ technical institution or national technical certificate (NTC) in Building Trades in relevant subjects as stated in above.

### **2.4.2.2 Higher National Diploma Programme**

Applicants with the following qualifications may be considered for admission in the HND Programme by direct entry are as follows: The entry requirements for the HND Programme as stated above; ND in Surveying and Geoinformatics with a minimum of lower credit pass; A minimum of one year Post-National Diploma cognate work experience in the field of Surveying and Geoinformatics. In addition, candidates with ordinary Pass at ND level must have at least 2 years post qualification experience.

## **2.4.3 Curriculum Structure in Universities**

A minimum period of five (5) years comprising of ten (10) semesters is stipulated for the completion of first degree course in surveying for post-secondary leavers. Nine of the ten semesters with 17 weeks in each semester are to be spent in lectures, tutorials, laboratory work and practical work. The remaining semester which is fixed as the second semester of the 4<sup>th</sup> year is to be spent by the students on the mandatory Supervised Industrial Work Experience Scheme (SIWES). The areas are; Pre-surveying and foundation courses (i.e. mathematics, physics, computer science, statistics, geology, geophysics, economics, accounting, management planning and general studies), Land surveying, Geodesy, Photogrammetry and Remote Sensing, Survey laws, Regulation and Professional Practice, Cartography and Hydrographic Surveying. Two facts are evident from the details of these seven key areas; firstly, the programme is aware that the surveyors of the future are going to interact more with professionals and academics in other areas in the course of their professional practice. Therefore, he must be equipped to appreciate others and be appreciated during those interactions. Secondly, the programme recognizes the new technologies that are available to the profession and avails these abilities in the new standards. Remote sensing, satellite positioning, inertia surveying and computer aided land information management are given prominent position in the detailed courses of study.

## **2.4.4 Curriculum for Mono-technics and Polytechnics**

The curriculum of all ND and HND programmes consists of four components: General Studies/ Education, Foundation Courses, Professional Courses and SIWES. The General Education component shall include courses in Art and Humanities, English Language, Communication, History shall be compulsory. Mathematics and Science (for non-science programmes) Social Studies - Citizenship (Nigerian Constitution) Political Science, Sociology, Philosophy, Geography, Entrepreneurship, Philosophy of Science and Sociology are compulsory. The General Education component shall account for not more than 15% of the programmes contact hours.

Table 1: Shows a comparison of Architecture and Surveying disciplines

<b>Architecture</b>	<b>Surveying</b>
<b>Definition</b>	<b>Definition</b>
1. The Practice of the Building Art. 2. The Science and Art of Building.	1. The Practice of the Surveying (measurement) Art. 2. The Science and Art of Surveying
<b>Professional Training Objective</b>	<b>Professional Training Objective</b>
1. Development of design skills based on the application of a systematized body of knowledge – Architectural Sciences. 2. Architectural Sciences inform creative problem solving in the synthesis of architecture design.	1. Development of surveying skills based on the application of a systematized body of knowledge – Geo-informatics. 2. Geo-informatics sciences inform creative modern problem solving in the synthesis of Surveying and mapping.
<b>Theory (Science)</b>	<b>Theory (Science)</b>
The development of knowledge base in Architectural sciences to include the following: <i>Physical Science:</i> Study of descriptive geometry and applied mathematics. <i>Social and behavioral Science:</i> Study of Human Settlement patterns, man’s psychological and behavioral response to environment. <i>Building Sciences:</i> Study of building materials and construction methods, building economics etc. <i>Environmental Sciences:</i> Study of climatic factors, landforms and topography on the built environment. <i>Engineering Sciences:</i> Study of Electrical, Mechanical and Structural systems in buildings.	The development of knowledge base in surveying and mapping sciences to include the following: <i>Physical Science:</i> Study that utilizes mathematical physics as its basic tool. <i>Social and behavioral Science:</i> Study of past and present settlement patterns and growth in forecasting future development for mitigation purposes. <i>Building Sciences:</i> Study that utilizes basic arithmetic’s in solving real engineering and construction problems. <i>Environmental Sciences:</i> Study of dynamic or changing variables i.e. climate, vegetation, land-use, topography etc. <i>Engineering Sciences:</i> Study that utilizes of Electrical or Mechanical systems for remotely sensed measurements.
<b>Practice (Art)</b>	<b>Practice (Art)</b>
Development of design skills in the following: Housing Design, Urban Design, Industrial Facility Design and Recreational facility Design.	Development of surveying skills in the following: Cadastral Surveying, Photogrammetric Surveying, Geodetic Surveying and Hydrographic Surveying.
<b>Academic Qualification in Architecture</b>	<b>Academic Qualification in Surveying</b>
Bachelor of Science/ Technology/ Architecture (B.Sc/Tech/Arch), Post Graduate Diploma (PGD), Master of Science/ Technology/ Architecture (M.Sc/Tech/Arch), Master of Philosophy (M.Phil), Doctor of Philosophy/ Architecture (PhD/ D. Arch).	Bachelor of Science/ Technology (B.Sc/Tech), Post Graduate Diploma (PGD), Master of Science/ Technology (M.Sc/Tech), Master of Philosophy (M.Phil), Doctor of Philosophy/ Surveying and Geoinformatics (PhD).
<b>Professional Qualifications in Architecture</b>	<b>Professional Qualifications in Surveying</b>
1. Architects Registration Council of Nigeria (ARCON) registration 2. Fellowship of professional Institute.	1. Professional Diploma (PD) 2. Surveyors Council of Nigeria (SURCON) registration. 3. Fellowship of professional Institution(s).

**2.5 Accreditation of institutions offering Surveying and Geoinformatics**

**2.5.1 Academic accreditation**

The Nigeria Universities Commission is responsible for the accreditation of Universities of offering Surveying and Geomatics programme, while each of the programmes offered either at the ND or HND level shall be accredited by the NBTE before the diplomat can be awarded either of the diploma certificates.

**2.5.2 Professional accreditation**

Section 10, Subsection (1) a, b and c of the Enabling Act of SURCON, established by CAP 425 of the Law of the Federal Republic of Nigeria, 1990 provides the SURCON to approve institutions, courses of training and qualification in Surveying and Geomatics in Nigeria or elsewhere which the Council considers is properly organized and equipped to do so. Subsection (2) of this same section provides the Council to from time to time, publish in a Gazette a list of any qualification in the profession approved by it. Subsection 3, 4 and 5 further mandates the Council the right to withdraw any approval given by it in respect of any course, qualification or institution, as well as procedures to be followed in doing so.

Table 2: Surveying programmes in Nigeria Institutions and their accreditation status.

S/No	Programme	Institution not accredited	Institution accredited	Total of Institution
1	ND	0	35	35
2	HND	0	22	22
3	PD	0	2	2
4	PGD	1	3	4
5	BSc/ BTech	0	16	16
6	MSc/ MTech	4	8	12
7	PhD	2	4	6

There are many tertiary institutions in Nigeria being licensed or accredited by the NBTE, NUC and SURCON offering at least two (2) years diploma (ND or HND), five (5) year undergraduate degree (bachelor degree) or postgraduate degrees (master or doctoral degrees) delivering lectures predominantly in a traditional, face-to-face, non-distance education format. List of accredited institutions in Nigeria has also been categorized in terms of Federal Universities, State Universities, and Private institutions to ease identification. Table 2 shows that SURCON currently recognize twenty six (26) Universities and thirty-five (35) Monotechnics/ Polytechnics in Nigeria offering courses in Surveying and Geoinformatics at different levels. Though there are institutions offering Surveying and Geo-information that are yet to receive approval from NBTE , NUC and SURCON.

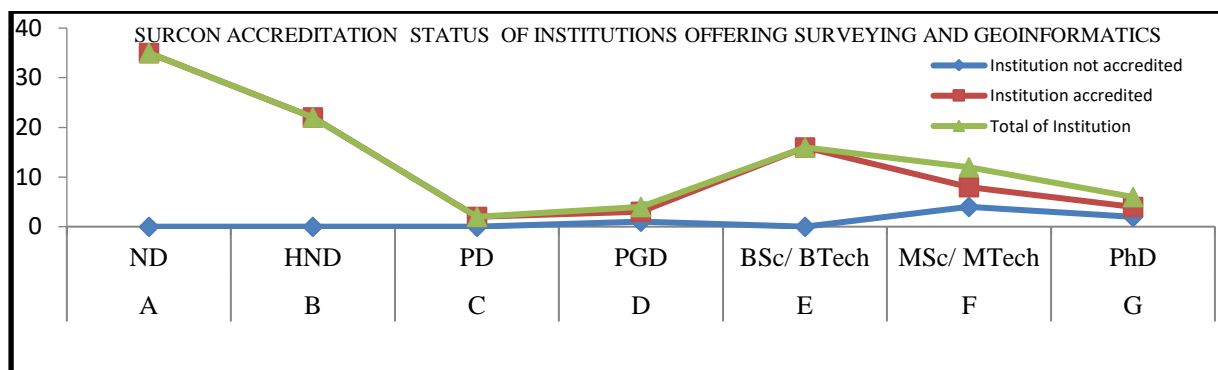


Figure 1: Showing accreditation status of Nigerian institution offering Surveying and Geoinformatics

From figure 1 the line graph shows that all institutions offering the following programmes are accredited (ND, HND, PD, BSc/ BTech) since they all have zero value at the not accredited column. But we have 1 PGD, 4 MSc and 2 Doctoral degree programmes yet to be accredited.

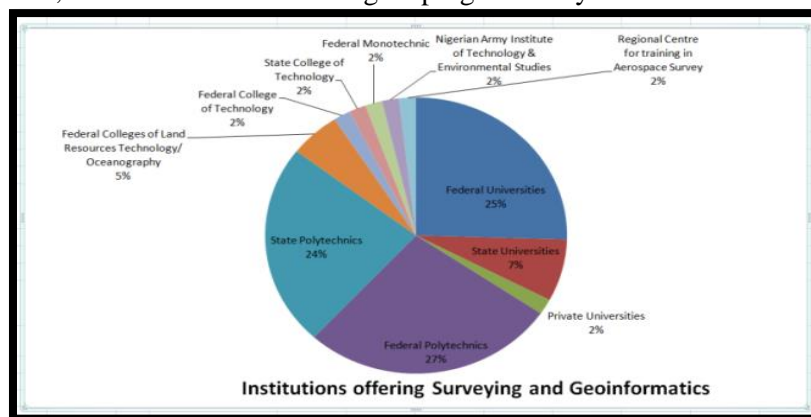


Figure 2: Shows pie chart of institutions offering Surveying and Geoinformatics

The figure 2 shows that 25% for Federal Universities in Nigeria are offering Surveying and Geoinformatics and 7% for State Universities while figure 3 shows spatial distribution of universities offering Surveying and Geoinformatics. On the other hand 2% for Federal Monotechnic, 27% for Federal Polytechnics and 24% for State Polytechnics while 2% for Federal College of Technology and 2% for State College of Technology. Other institutions offering Surveying and Geoinformatics are Federal College of land Resources technology/ Oceanography with 5%, The Nigerian Army Institute of Technology & Environmental Studies with 2% and Regional Centre for training in Aerospace Survey 2%. Universities (Federal, State and Private) have a total of 34%, Mono/Polytechnics (Federal and State) have a total of 53%, College of Technology (Federal and State) has a total of 4% and other institutions (Federal College of land Resources technology/ Oceanography, Nigerian Army Institute of Technology & Environmental Studies and Regional Centre for training in Aerospace Survey) have a total of 9% in institution offering Surveying and Geoinformatics.

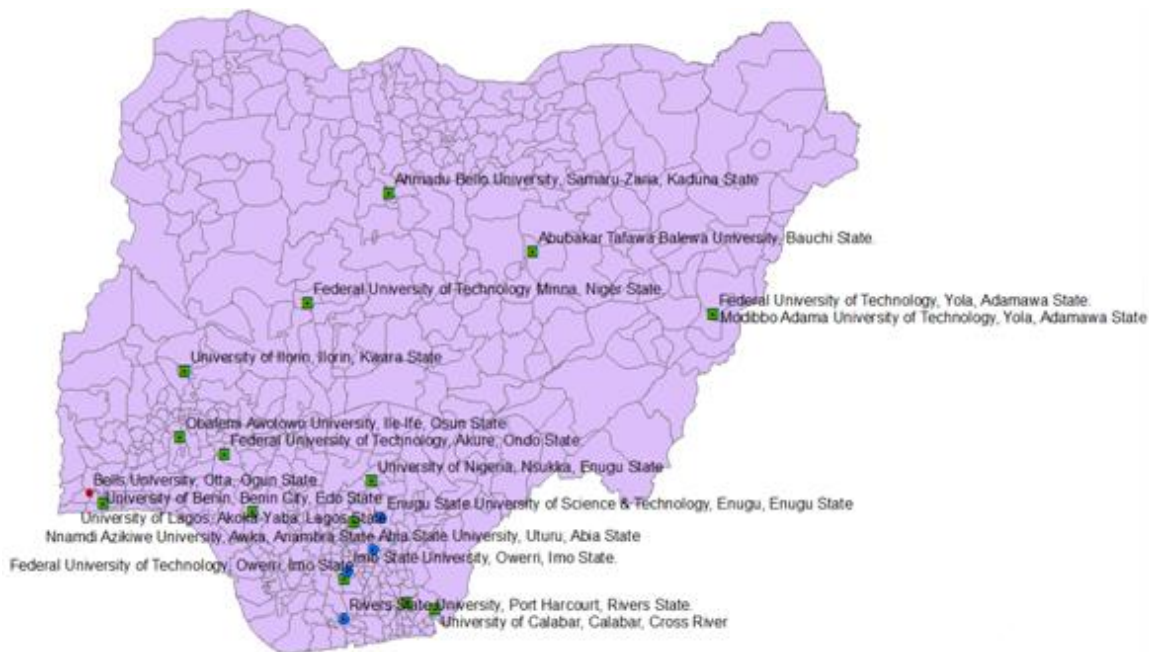


Figure 3: Shows spatial distribution of universities offering Surveying and Geoinformatics

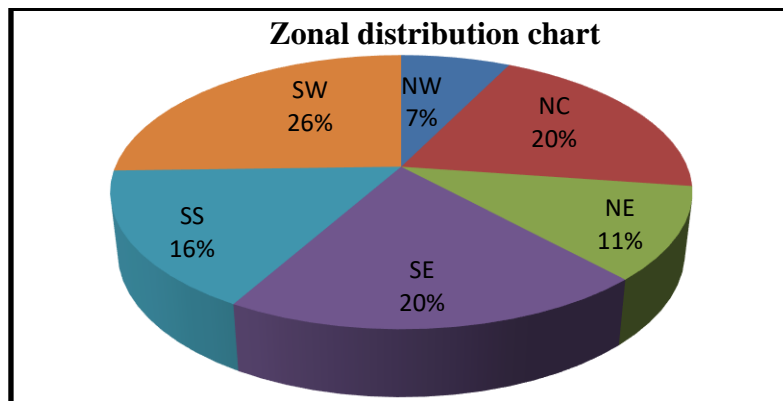


Figure 4: Showing the zonal distribution of Surveying institutions



The figure 4 reveals 7% of institutions in Nigeria offering courses in Surveying and Geoinformatics are found in the North West geopolitical zone, 20% surveying institutions are in the North central Zone, 11% are in the North East zone, 20% are in South East, while 16% are in the South South zone and 26% surveying institutions are in the South West zone. The North west zone was found to have the smallest while the South west zone has the largest percentage of Surveying institutions.

## **2.6 Factors responsible for poor Students enrolment in Surveying and Geoinformatics**

- a. Very low regard and poor publicity for the Profession of Surveying in the country.
- b. The perception of poor career prospects for graduates in Surveying.
- c. The physically demanding nature of the practical aspects of the training of Surveyors.
- d. Poor awareness about the entry requirement for the profession
- e. Fear and poor understanding of calculations involved in it
- f. Perception of students that surveying as a course is not only difficult but also boring.

## **3.1 Registration of Surveyors in Nigeria**

The Surveyors Registration Council of Nigeria act, established under Decree no. 44 of 1989 (Cap 425 LFN 1990) and now S18 LFN 2004 is charged with the general duty to register surveyors and regulate and control the practice of survey profession in its entire ramification in Nigeria. The Act grants the Council absolute unshared power, except those specified by the Act, to register persons, offices, corporate entities, institutions, courses of training, qualifications etc for the purpose of the Act and for the conduct of the practice of the profession in Nigeria. Registration of Surveyors is the central and most regular function of the Council. Applications for Registration by each of these entities have unique forms, formats, specifications and processes. However, since the topic of this seminar is Registration of Surveyors, it is deemed that the presentation deal only on people seeking to be registered into any of the four parts of the Register of Surveyors. Such persons shall possess and or satisfy the following benchmarks;

1. Ordinary level examinations with five credit score including English, Mathematics and Physics/ Geography obtained at not more than two sittings.
2. Possess the approved minimum academic qualification for the category he seeks registration and or passed the examinations approved by the Council.
3. Be of good character, at least 21 years of age and a person not convicted in Nigeria or elsewhere of an offence involving fraud or dishonesty.
4. Agree to acquire requisite field experience, skill and professional training over the specified period of time under supervision of a Surveyor qualified and eligible to give the training.
5. Paid the necessary fees and properly filled and submitted to SURCON the application forms with all the required attachments and letter of endorsement and acceptance for training to be conducted in an approved **and** eligible office by a surveyor who is qualified to supervise the applicant.
6. Agree to abide by all conditions, terms and instructions given to him from time to time by the Council.

## **3.2 Professional Registration Requirements**

Registration of Surveyors is the approved step by step processes and procedures a person seeking to become registered as a member of survey profession in Nigeria needs to fulfil before his name is entered into the relevant part of the Register of Surveyors. It includes satisfying the level of knowledge, skills, character, laid down conditions and obligations required to be satisfied by a person before he can be enrolled for registration into the profession. A person is said to be registered when his details are entered into the Register. Registration entitles a person to practice the profession only when he discharges professional obligations required of him, from time to time, by the Council. Section 9 of the Enabling Act of the SURCON provides the following professional and academic requirement to be

attained by person seeking to be enlisted in part of the survey register. Subject to baseline requirements stated for professional registration requirements in section 9 of the act, the registration categories listed for a persons seeking to be registered in any part or the register/one of the four categories of the profession as follows: Surveyor, Pupil Surveyor, Technologist, Technician; and lastly an applicant can also be enrolled as a Pre-Technician. Note that the names of the Pre-Technicians are not entered into the Surveyors Register.

#### *3.2.1.1 Surveyor*

A person shall be qualified as a Surveyor if the following conditions are meet; Attained the age of 21 years and passes the qualifying examination for registration conducted by the council. Be of good character and has not been convicted in Nigeria or elsewhere of an offence involving fraud of dishonesty. Holds a certificate recognized by the council and had not less than two years post-qualification practical experience in the profession, and had passed the examination approved by the Council. For a non-nigerian, hold qualification granted: provided that the other country accords Nigerian professional Surveyors the same reciprocal treatment and that he satisfies the Council that he has had sufficient practical experience as a surveyor. This shall be granted for 1 year and renewable on an annual basis for another two years. The Nigerian Surveyors are classified under two categories i.e. the private practicing surveyors (Principals) and the paid employment surveyors (Non-Principals). A Surveyor, whether principal or non – principal, is an officer in the profession; his general duty is to organize and manage human, capital, situational, material resources to achieve the objective of a project or of the professional practice. A registered surveyor is not a field worker. He/she is Teacher, Instructor, Mentor, Leader and Manager in surveys production line, his/her office is approved for training of persons seeking to be members of the profession. He upholds the ethics and the general conduct of the profession.

A person is eligible to be registered as a Surveyor if; he/she passes the qualifying examinations for registration recognized or conducted by the Council, or not being a Nigerian, he holds a requisite qualification from a country that accords Nigerian Surveyors the same reciprocal recognition. This registration is for one year in the first instance and renewable on annual basis for another two years, or holds a certificate recognized by the Council and has a minimum of two years post qualification experience and passes an examination approved by the Council. Certificates and Seals issued to Registered Surveyors are property of the Federal Government of Nigeria. They should be used professionally and surrendered to the Council on passing on of a surveyor or on ceasing of membership of the profession. A Registered Surveyor shall constantly improve his knowledge and skills; attend the SURCON approved annual Mandatory Continuous Professional Development Courses; maintain discipline, pay annual fees prescribed by the Council for both self and company, where applicable.

#### *3.2.1.2 Pupil Surveyor*

A person shall be eligible to be registered as a pupil surveyor if he has satisfied the general conditions specified. And holds a certificate recognized by the Council and has not had two years post – qualification practical experience in the profession or has passed the examinations (for enrolment into pupil surveyors'cadre) approved by the Council and has not had two years post qualification practical experience. The minimum academic qualification for direct entry into this category is a BSc or BTech Surveying and Geoinformatics or HND with PGD or PD Surveying and Geoinformatics. For degree in the cognate courses which includes BSc. Geography; Physics; Geology; Mathematics; Photogrammetry; Computer Science; Remote Sensing; Cartography; Hydrography and PD in Surveying and Geoinformatics or PGD or PD with MSc. Surveying and Geoinformatics plus NYSC discharge or exemption certificate. Survey pupilage runs for at least two years after enrolment by the Council and it is important to note that pupilage in Surveyors schemes is the processes of transition

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Surveying: Academic and Professional Discipline (11705)

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from Technical cadre to Officer status in the hierarchy of the profession. It is a learning period when an applicant possessing requisite academic qualifications or having passed the approved examinations acquires, under supervision of a registered and eligible supervisor in an approved office, the necessary technical, legal, administrative, leadership, managerial knowledge and skills that makes him fit to be registered as a Surveyor.

### 3.2.1.3 Survey Technologist

An important fact to note is that the Survey Technologist are a part of the bulk form of the technical team of the profession. Technologists implement field and office plans; they usually lead the field party; take decisions in the field and render reports to supervisors. A person is entitled to be registered as a Survey Technologist if he satisfies the minimum aforementioned requirements if; he/she holds a certificate recognized by the Council and has not had two years post - qualification practical experience in the profession or passed the examinations (for Survey Technologist enrolment) approved, from time to time, by the Council and has not had two years post qualification practical experience. The minimum academic qualification for direct entry into this category is HND obtained from SURCON accredited institutions the following; Surveying and Geoinformatics, Photogrammetry, Remote Sensing, Cartography and Hydrography with NYSC discharge or exemption certificate.

### 3.2.1.4 Survey Technician

Recall that as earlier mentioned the Survey Technicians are the other bulk of the technical team of the profession. A person is entitled to be registered as a Survey Technician if he satisfies the minimum requirements set out in professional registration requirements above and holds a certificate recognized by the Council and has not had two years post - qualification practical experience in the profession or passed the examinations (for Survey Technician enrolment) approved, from time to time, by the Council and has not had two years post qualification practical experience. The minimum academic qualification for direct entry into this category is ND obtained from SURCON accredited institution; Surveying and Geoinformatics, Photogrammetry, Remote Sensing, Cartography and Hydrography.

### 3.2.1.5 Survey Pre-Technician

A person is entitled to be registered as a Survey Pre-Technician if he satisfies the minimum requirements set out in professional registration requirements above. Pre-Technicians are not entered into the Register of Surveyor. A person can progress within the profession to qualify for registration into any category of the profession.

## 3.3 Registration through Career Progression

A person seeking to be registered into any category of the profession can either enter directly by obtaining the requisite qualifications or progress through passing examinations approved, from time to time, by the Council and after enrolment and undergoing the prescribed professional training in an approved office. Table 3 show the registration category, pre-require, future professional exams and limitations of any cadre.

Table 3: Shows registration category, pre-require, future professional exams and limitations.

S/N	Category	Pre-requisite	Next Professional Exams	Limitations
1	<i>Surveyor</i>	Passed professional exams papers (1) Survey Laws, Regulations and Professional Practice, (2) Professional Essay and (3) Survey Folio.	Nil	Nil
2	<i>Pupil Surveyor</i>	B(Sc/Tech) or PGD or PD or passed papers (1) Mathematical & computational techniques, (2) Land Surveying & Land Information System, (3) Geodesy, (4) Hydrography and (5) Photogrammetry & Remote Sensing.	(1) Survey Laws, Regulations and Professional Practice, (2) Professional Essay and (3) Survey Folio.	Must have work experience for at least 2years in an approved office.

S/N	Category	Pre-requisite	Next Professional Exams	Limitations
3	<i>Technologist</i>	HND or passed papers (1) General paper, (2) Mathematical Method and computation, (3a & 4a) Land Surveying 1 & 2 or (3b & 4b) Photogrammetry 1 & 2 or (3c & 4c) Hydrography 1 & 2.	(1) Mathematical & computational techniques, (2) Land Surveying & Land Information System, (3) Geodesy, (4) Hydrography and (5) Photogrammetry & Remote Sensing.	Must have work experience for at least 2years in an approved office.
4	<i>Technician</i>	ND or passed the following papers (1) Basic Survey Principles & Methods, (2) Basic Mathematical Method and Computation, (3a) Land Surveying or (3b) Photogrammetry or (3c) Hydrography.	General paper, Mathematical method and computation, Land Surveying (1 & 2) or Photogrammetry (1 & 2) or Hydrography (1 & 2).	Must have work experience for at least 2yrs in an approved office.
5	<i>Pre-technician</i>	An ordinary level credit passes in English language, Mathematics and Physics compulsorily with any two science related subjects such as Geography, Chemistry, Biology and Technical Drawing.	(1) Basic Survey Principles and Methods, (2) Basic Mathematical Method and Computation, (3a) Land Surveying or (3b) Photogrammetry or (3c) Hydrography.	Must have work experience for at least 2years in an approved office. Not listed in any of the 4 registers.

#### 4.1 Career Opportunities of Surveying and Geo-informatics in Nigeria

Career opportunities in Nigeria and diaspora are as follows: Telecommunication Industry (i.e. NCC, MTN, AIRTEL, GLO, 9 mobile etc.), Military/ Paramilitary (i.e. Army, Air-force, Navy, Police etc.), International Oil Companies (i.e. Agip, Elf, Shell, NNPC, Exxon-Mobil, Chevron etc.), International, Federal, State and Local Survey Department, Federal, State and Private tertiary institution (i.e. Universities, Polytechnics etc.), International, Regional and National Research Institutes (i.e. NASA, ESA, RECTAS, NASRDA, NIOMR etc.), Global, Regional, Federal and State Institutes of Agriculture and Forestry (i.e. FAO, GLTN etc.), Nigerian Ports Authority (NPA), Nigerian Inland Waterways Authority (NIWA), Nigerian Airways Management Authority and Federal Airport Authority of Nigeria (FAAN), Regional, Federal and State Environmental Protection Agencies, Engineering Construction Firms (i.e. Julius Berger, Arab Contractors, Saipem etc.), Joint and Private Survey Practice etc.

Table 4 identified five (5) key areas using SWOT analysis in discussing them, as modified from George (2022) Strengths, Weaknesses, Opportunities and Treats (SWOT) analysis of the survey practice.

Table 4: SWOT analysis of Surveying practice in Nigeria

S/N	Strength	Weaknesses	Opportunity	Threats
1	Unique and peculiar profession	Funding and Rapid instrumentation and methods of data collection changes	Globalization	Sharp practices in the industry
2	Need for land as housing demand constantly increases	Capacity building/ professional development	GIS reforms	Absence of regulation
3	New trends and technology	Experience/professional competence (Cognitive ability, knowledge capability, business competence & ethics)	New technology	Obsolete technology
4	High need for effective land administration and management	Training/ Education (Excellent communication skills, Information technology skills, data presentation skills and management skills).	Increasing demand of survey services	Ease from technology
5	High demand of professional its services and products	One man business (show) and lack of cooperation amongst colleagues	Land registration legislation	Professional boundaries Collapse/ breakdown

## 4.2 Summary

1. The academic and professional process for becoming a Surveyor in Nigeria remains tough though surmountable. The minimum age required for a Surveyor under the Surveyors Council Enabling Act, established by CAP 425, Laws of the Federal Republic of Nigeria, 1990 is 21 years.
2. Following the Nigerian educational system, its associated setbacks, coupled with the rigorous academic and professional requirements for the surveying profession, the average age of a Surveyor registered with the SURCON is always within 30 - 35 years.
3. This has a diminishing national effect on the workforce of professional Surveyors as compared to other professional Surveyors as compared to other professions, and as well influences its career choice by secondary school leavers.

## 5.1 Recommendation

The following recommendations if carefully implemented will go a long way removing the bottlenecks, hence; attract qualified candidates to join the Surveying profession.

1. More career talks and public enlightenment campaigns should be made in secondary schools, electronic and print media while second choice candidates that could not meet the entry requirements of their desired course(s) should be counselled from time to time.
2. The Federal, State and Local governments should award survey projects directly to competent and qualified professionals in their respective fields.
3. Surveying and Geomatics curricula should be reviewed and modified from time to time in line with advances in information technology and instrumentation.
4. The Nigerian Institution of Surveyors and the Surveyors' Council of Nigeria should work closely with professionals in Higher Institutions, Public Service and in private practice to modernize professional practice in Nigeria, and promote the well-being of the profession.
5. A pupillage school of surveying should be established to cater for the registration of surveyors with first degree certificate or its equivalent in Surveying and Geomatics, the training for our intending surveyors must be intensify by better equipped and better staffed survey programmes in all tertiary institutions and as well consolidate and expand if need be just like the law school. This should be an alternative to the present requirement in the SURCON Enabling Act.

## 5.2 Conclusion

The poor perception by the public concerning career prospects for graduates in the profession is fast changing because of the high rate of general unemployment in the country. People have now come to know that it is easier and more lucrative to own a private Surveying and Geomatics company than to build a hospital or set up engineering firm. Hence, more still need to be done to ensure an increase number of Surveying and Geomatics undergraduate in the Country. Surveying students today are Surveyors of tomorrow and surety for the development and sustenance of the Surveying Profession.

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