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NEXUS AMONG GEOSPATIAL PROBLEMS, EMERGING GEOSPATIAL TECHNOLOGY APPLICATIONS AND SUSTAINABLE SURVEY PRACTICE IN NIGERIA

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PRESENTATION OUTLINE

- ▶ Introduction
- ▶ The Surveying Profession
- ▶ The legal Framework for Survey Practice in Nigeria
- ▶ Geoinformation Technology and Applications
- ▶ Sustainable Development Concept and Goals
- ▶ Attempt in Implementing Sustainable Development Goals and Surveyors' Role
- ▶ Consideration on Sustainable Practice
- ▶ Future and Challenges of Surveying Profession
- ▶ Conclusion

INTRODUCTION

- ▶ **Most of Man's earthly problems are initiated by stress on land due to anthropogenic factors especially the rapidly increasing human population.**
- ▶ ***Nigeria Population grew from just over 30 million in 1952 to around 120million in 2000 and over 160 million in 2012 and predicted to be about 206.139 million in 2020 (Worldmeter 2020)***
- ▶ ***As human population expands, the land-population ratio decreases and land values appreciate. Material resources therefore dwindled while human activities continue to stress the quality of land, water and air.***

INTRODUCTION

- ▶ *Since myriads of Geospatial problems resulting from the stress is bedeviling Nigeria and hindering her rate of development, geospatial information of which the spatio-temporal dimension is critical is increasingly needed as Decision Support in solving these overwhelming problems resulting from population explosion and its attendant decision problems.*
- ▶ *Consequently, the importance of measuring, monitoring and management of geospatial information is required for the implementation of sustainable development Goals cannot be overemphasized and it is becoming increasingly critical.*

INTRODUCTION

- ▶ *Examples abound in various aspects of National Development, projects that cannot be implemented and achieved without the use of current and accurate geoinformation in the development process.*
- ▶ *Improving revenue generation in a developing grassroots' economy (e.g. Local Government Areas) through Landuse Charge and other forms of taxation*
- ▶ *Generation, transmission and distribution of electricity affecting all national facets of production and management.*

INTRODUCTION

- ▶ *Planning, designing , building and maintenance of Infrastructures like roads, bridges, dams, Agriculture, Politics and Government business, Security, Environmental control and management, Health, etc*
- ▶ **Geospatial Information being an infrastructure is required as foundation for further development of a Nigeria.**
- ▶ **Surveyors and Geoinformation Practitioners have a major role to play in geoinformation production, management and utilization, with a need to add intelligence to geospatial decision making process in national development.**

THE SURVEYING PROFESSION

Surveying is one of the oldest professions known to humanity and has been important since the beginning of civilization.

The practice of Surveying in Nigeria can be described to be as old as Nigeria itself which is evidenced by

- i. the practice of the profession before the amalgamation of the Northern and Southern Protectorates in 1914.
- ii. Map of old Calabar town was produced on scale of 1/93000 by the Presbyterian Church as far back as 1868 (Ayeni, 1981).
- iii. Survey Department existed in Lagos and Kaduna as early as 1899 and 1900, respectively.

THE SURVEYING PROFESSION

- ▶ Fajemirokun (1988) defined Surveying as that branch of geosciences which deals with the location of points on the earth surface, the graphical representation and visual representation of such points, and the determination of the figure of the earth and its gravity field using the method of applied mathematics and physics as basic tools.
- ▶ The International Federation of Surveyors (FIG) according to Ghilani and Wolf (2008) define a *Surveyor as one who is able to do more than taking measurements but that with capacity and qualifications to conduct one, or more of the following activities;*

THE SURVEYING PROFESSION

- ▶ Determine, measure and represent the land, three-dimensional objects, point's field, and trajectories.
- ▶ Assemble and interpret land and geographically and economically related information.
- ▶ Use the information for planning and efficient administration and management of the land, the sea and any structure thereon.
- ▶ Carry out urban and rural development and land management and conduct research into and develop them.

THE SURVEYING PROFESSION

- ▶ Consequently, the **FIG** further stated that the Surveyor's professional task may involve one or of the following activities which may occur either on, above or below the surface of the land or the sea and may be carried in association with other professionals.
- ▶ The breath and diversity of the Practice of Surveying (Geomatics) as well as its importance in modern civilization are readily apparent from this definition. When compared with other contemporary definitions of surveying, the FIG definition promotes the breaking into new frontiers of Surveying and Geoinformatics practice.

THE LEGAL FRAMEWORK FOR SURVEY PRACTICE IN NIGERIA

- ▶ In Nigeria, the Surveying Professional Occupation is strictly regulated by law as reflected in Item 49 of the Exclusive Legislative List of Nigerian Constitution vesting power in Surveyors' Council of Nigeria (SURCON) as the Federal Government Agency to regulate and control the practice of Surveying Profession in all its ramifications through SURCON Act CAP S18, LFN 2004.
- ▶ Regrettably, the regulatory body has been paying attention to the regulation of the Cadastral branch of Surveying, with less emphasis on the other branches of Surveying, which is grossly against the Constitutional and Statutory power vested in SURCON and indirectly, undermining the Sustainability of the Survey Practice in Nigeria. This is not creating an enabling environment to widen the scope of Survey Practice in Nigeria for a viable Sustainable Development of the country.

GEOINFORMATION TECHNOLOGY & APPLICATIONS

Geoinformation technology comprises the technology and disciplines involved in geopositioning, mapping, and application of spatially oriented data and information.

The Technology involves field like

- ✓ **Geodesy**
- ✓ **Geomatics**
- ✓ **Hydrography**

- ✓ **Remote Sensing**
- ✓ **Photogrammetry**
- ✓ **GIS**

- ✓ **Cartography**
- ✓ **Global Navigation Satellite System (GNSS)**
- ✓ **UAS/UAV**

GEOINFORMATION TECHNOLOGY & APPLICATIONS

- ▶ **Geospatial information resulting from these various field of the technology are used as Decision Support in identification, assessment and management of land, air and water resources in our environment.**
- ▶ **Geospatial technology is open to valued application in many other disciplines, once they are involved in the use of geospatially-referenced data and information (e.g agriculture, environmental management and control, forestry, geology, civil engineering, utilities, health, security, etc).**

SUSTAINABLE DEVELOPMENT CONCEPT AND GOALS

Sustainable Development is a concept that originated from the World Commission on Environment and Development (WCED), 1987 Report (also known as the **Brundtland Report**) titled ***“Our Common Future”***.

- ▶ The report defined Sustainable Development as “development that meets the needs of the present without compromising the ability of the future generation to meet their own needs.”
- ▶ The overall goal of sustainable development is the long-term stability of the local, regional and national economy and environment, and it is only achievable through the integration of economic, environmental and social concerns through the decision-making process.

SUSTAINABLE DEVELOPMENT CONCEPT AND GOALS

- ▶ The United Nations comprising of governments of many nations have prompted the ideas of implementing sustainable development policies in order to achieve sustainability and stability of development projects. This was done by encouraging the countries to pursue the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs) in their development efforts.
- ▶ The SDGs are an intergovernmental set of aspiration that is forced on Seventeen (17) Sustainable Development Goals, 169 associated targets with 230 indicators are transformative steps which are urgently needed to shift the world onto a sustainable resilient path.

SUSTAINABLE DEVELOPMENT GOALS



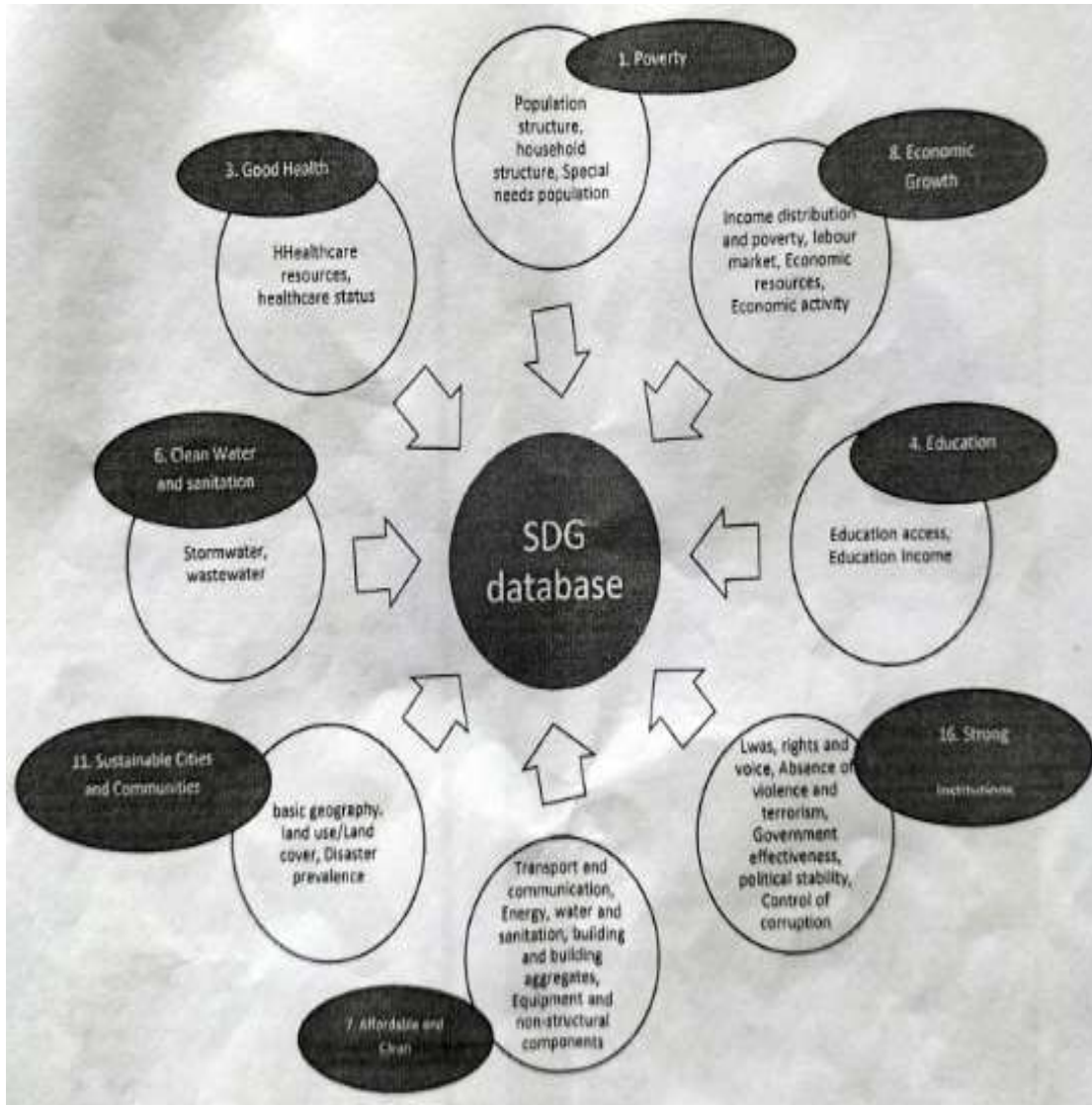
ATTEMPTS IN IMPLEMENTING SUSTAINABLE DEVELOPMENT GOALS AND SURVEYORS ROLES

There had been several attempts by world bodies; regional and national interests aiming at implementation of SDGs. All these are not unconnected to Surveyors playing an important role in geoinformation production, management, usage (applications), measuring and monitoring the performance of SDGs, all contributing to sustainable Development of Nations.

The attempts had come through bodies including among others;

- ✓ **The United Nations Conferences On Housing And Habitat**
- ✓ **FIG Agenda 21**
- ✓ **The South-East Asia Survey Congress (SEASC)**
- ✓ **The United Nations Initiative on Global Information Management (UN-GGIM)**
- ✓ **GEO4SDGs, etc**

GEO-for-SDGs



CONSIDERATIONS ON SUSTAINABLE SURVEY PRACTICE

- ▶ Sustainability of Survey Practice meaning the capacity of surveying practice for continuance into the long-term future is majorly hinged on surveying profession's contribution to the implementation of Sustainable Development Goals (SDGs).
- ▶ A Modern Surveyor should be interested in other areas of geospatial interest which include among others, geosystems and processes and other environmental issues, infrastructural development and Building Information Modeling (BIM), Spatial Planning, etc.
- ▶ Also include generation of geospatial information from integrated earth related data which can be utilized in Decision Support systems of nation's development.
- ▶ Surveyors are a critical mass in every aspect of providing explicit solutions to geospatial problems but because of the knowledge gap, many of the Surveying Practitioners are bottle-necked with a very narrow spectrum of the practice, (especially cadastral practice) and unable to think and operate outside the box.

CONSIDERATIONS ON SUSTAINABLE SURVEY PRACTICE

- ▶ It had been stated that “The SDGs and land-related indicators will reshape and influence our profession profoundly in this decade. It is of crucial importance that FIG Member Organizations and Surveyors are aware and prepared on how their (daily) work contributes to the achievement of the SDGs and how the implementation and achievement of the SDGs will enhance a Sustainable Survey practice by enlarging their coast and increasing the breath and diversity of their practice”.
- ▶ With a continuously distributions of precise and timely, Surveyors and Geospatial Professionals support the measuring of SDG – related performance..

CONSIDERATIONS ON SUSTAINABLE SURVEY PRACTICE

- ▶ Nigeria is endowed with a lot of natural, human and material resources which are basic ingredients for development and if the country is going to develop, manage, exploit and use the resources for the nation's development benefits, adequate data and information of which a greater percentage of them is geospatial are required. If Nigeria surveyors are up to the task of producing such data and information, it will definitely expand the breadth and diversify practice and enhance professional sustainability.
- ▶ The handling of the Mandatory Continuing Professional Development Program (MCPD) needs to be improved on in other to be made more effective.

CONSIDERATIONS ON SUSTAINABLE SURVEY PRACTICE

- ▶ **The need to inculcate the idea of geospatial problem solving and solution provision capabilities into Survey Practice has made Federal School of Surveying (FSS), Oyo ‘a notable higher institution of learning in Nigeria’ to introduce a course on Sustainable Survey Practice at the Professional Diploma Level. Other institutions are being encouraged to follow suit.**
- ▶ **An intimate connection between Survey Professional Practitioners and the inspiring world of Academics is also being encouraged. Real-world constraints of executing projects can only be gotten from professional practice, while surveying practice must always be in complete harmony with academics to inject new ideas into practice.**

CONSIDERATIONS ON SUSTAINABLE SURVEY PRACTICE

- ▶ **Surveying and Geoinformatics departments in higher institutions of learning should keep in contact with their Alumni and their Organizations for further knowledge transfer and continuous relevance in their professional practice.**
- ▶ **Educational institutions can also be of immense help to mapping organizations, for example, The Office of the Surveyor – General of the Federation (OSGOF) in the development of new concepts and methodology for Core Data Sets production and provision.**

FUTURE AND CHALLENGES OF SURVEYING PROFESSION

- ▶ **Surveyors should keep an open mind in order to be relevant, so there is the need of changing of Surveyor's mindsets with respect to change. Open mindedness must be learnt to evaluate and fulfil users' needs instead of producing traditional products.**
- ▶ **The traditional map concept alone is no longer sufficient in today's world with varying complex geospatial problems.**
- ▶ **The traditional surveyor is under pressure of competition from all allied professionals because of improvements brought about simplification of instruments and methods, not requiring too much skill making every operation easier.**

FUTURE AND CHALLENGES OF SURVEYING PROFESSION

- ▶ **The need for understanding geospatial problems which is on the increase and the impact of computing and other continuously emerging technologies call for a continuous widening of the present narrow scope of training curriculum for professional surveyors.**
- ▶ **Most institutions of learning have low intake of students. There is the need to attract young minds who are a key demographic that we must value and encourage to participate for future development of Surveying Profession.**

CONCLUSION

Surveying as a profession has grown from providing knowledge of the shape and size of the earth to include the understanding of earth related processes and problems and the production and management and the use of geospatial information. Surveying using geospatial technology as an innovative sector is the key to brighter future for the world, looking at the huge range of opportunities surveying industries offer, and the relevance of Surveying in solving Worlds development problems and implementing, monitoring and measuring the achievements of Sustainable Development Goals of nations. This in turn greatly enhance a Sustainable Survey Practice by increasing the breadth and diversity of the surveying professional practice.



THANK YOU
for your
ATTENTION!

