



# SPACE SUSTAINABILITY AS A GAME CHANGER: LEGAL BEST PRACTICES FOR SPACE SUSTAINABILITY

31<sup>ST</sup> UN/IAF WORKSHOP ON SPACE TECHNOLOGY SOCIAL-ECONOMIC  
BENEFITS.

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# INTRODUCTION

## WHAT IS SPACE SUSTAINABILITY?

- According to UNCOPUOS guidelines on long-term sustainability is defined as the ability to maintain the conduct of space activities indefinitely into the future in a manner that realizes the objectives of equitable access to the benefits of the exploration and use of outer space for peaceful purposes, to meet the needs of the present generations while preserving the outer space environment for future generations

## WHY SPACE SUSTAINABILITY?

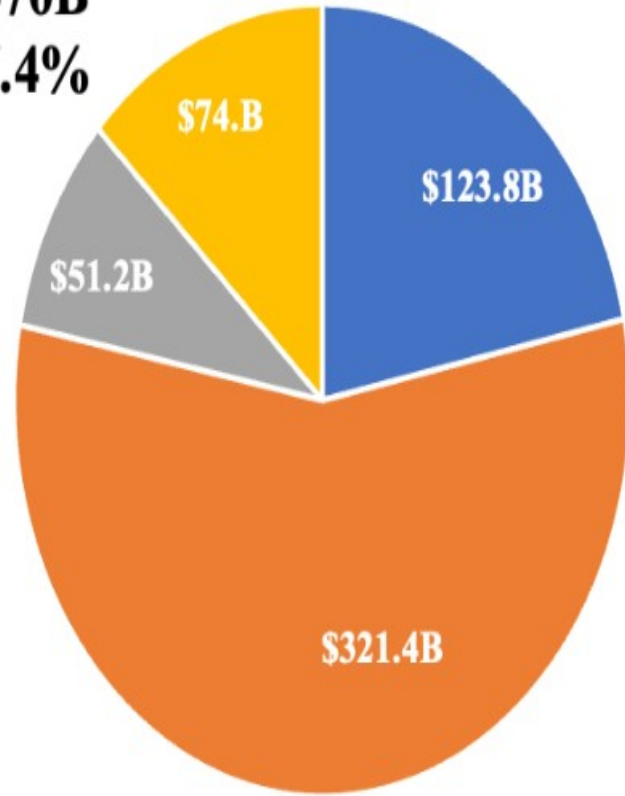
- The outer space is a finite resource leveraged terrestrially through satellites for human use.
- Immense terrestrial reliance on space science and technology for daily activities.
- Congestion in outer space resulting from, space debris-including objects without maneuverability, increased satellite launch due to evolving technological development, thereby increasing the risk of collisions and the Kessler syndrome effect.
- Economic development of nations through revenue generated from space activities





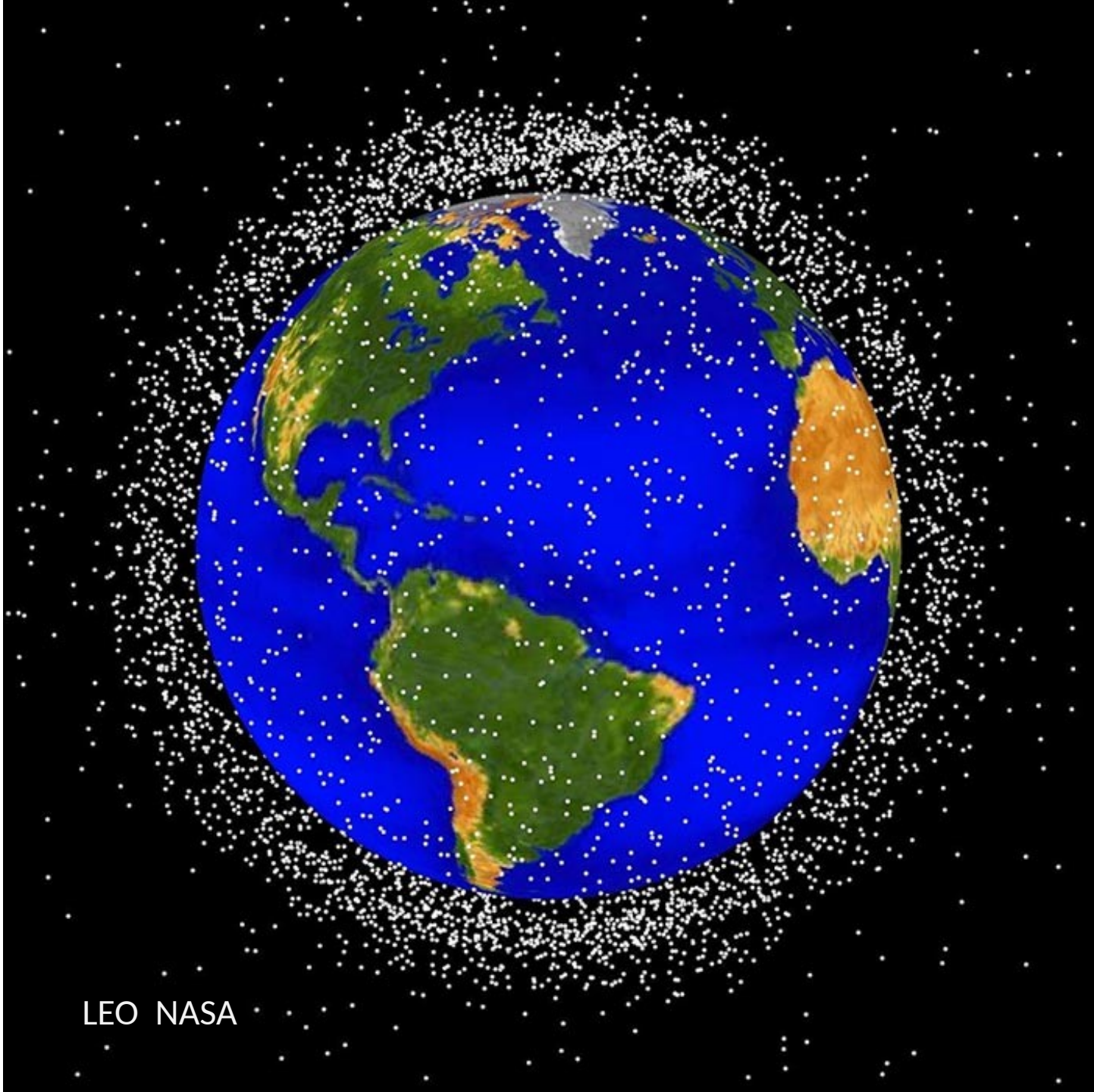
## Global space activity by category, 2023

**\$570B**  
**+7.4%**



- Commercial Infrastructure and Support Industries
- Commercial Space Products and Services
- Non-U.S. Government Space Budgets
- U.S. Government Space Budgets

Source: Space Foundation database

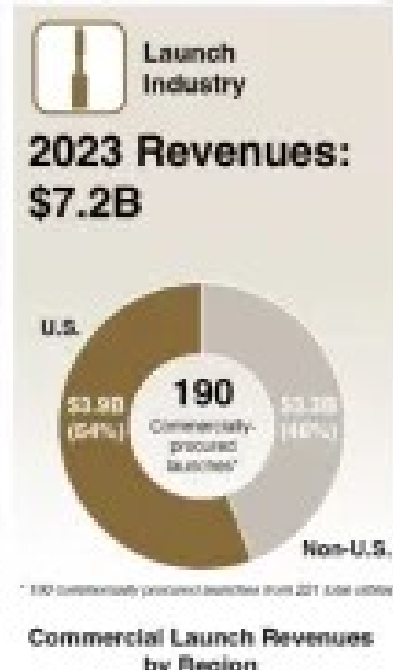


LEO NASA

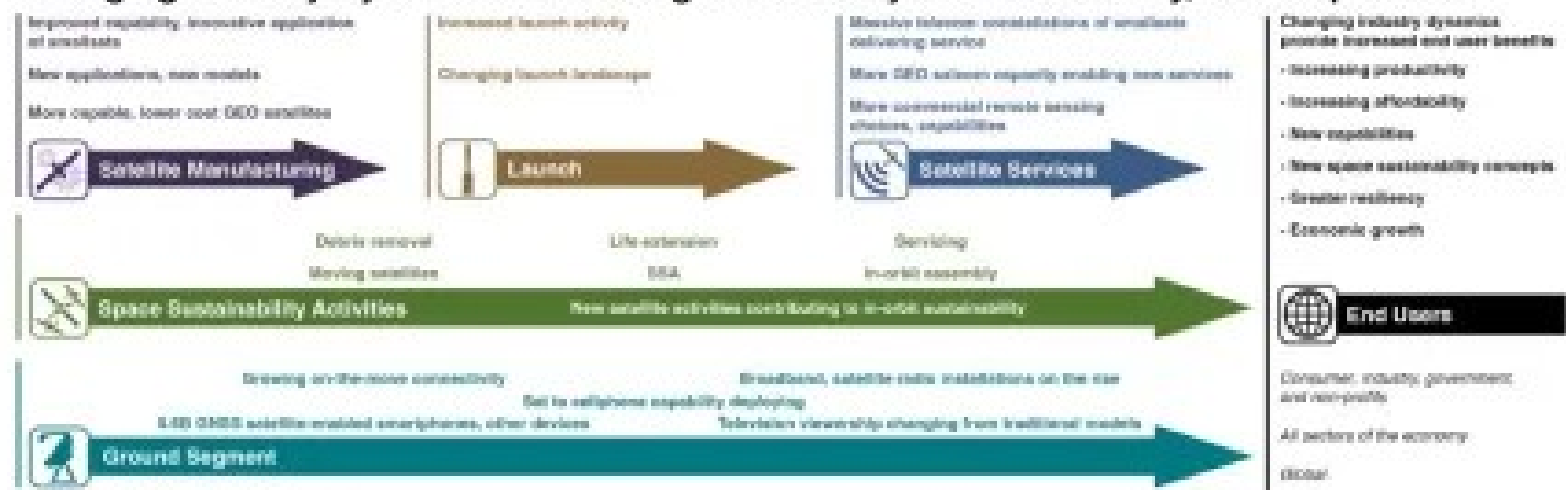
# 2023 Global Satellite Industry Revenues

## The Satellite Industry in Context

(2023 revenues worldwide in billions of U.S. dollars)



## Changing Industry Dynamics: Increasing Affordability and Productivity, New Capabilities





# THE ROLE OF LEGAL FRAMEWORKS IN SPACE SUSTAINABILITY

- **Hard/binding Laws**
- **International Treaties and Agreements**
  - United Nations International Space Legislations.
- National Space Legislation.
- Soft Law Instruments
- Principles
- United Nations COPUOS Guidelines for Long-term Sustainability space activities .





# THE ROLE OF LEGAL FRAMEWORKS IN SPACE SUSTAINABILITY

- Treaty laws/Hard Laws
- The Outer Space Treaty 1967
- Article I OST: establishes the freedom of use and exploration with discrimination of access, freedom is inherent to sustainability but not absolute.
- “Province of all mankind.”
- Article IX of the OST establishes an obligation to avoid harmful contamination of outer space, including the Moon and other celestial bodies, and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and to avoid **harmful interference** with the activities of other States.
- Article VI: States internationally responsible for national activities in outer space, including ensuring authorization and continuous supervision of space activities by non-governmental entities.



# THE ROLE OF LEGAL FRAMEWORKS IN SPACE SUSTAINABILITY

- Registration Convention
- Art. II(1) *When a space object is launched into earth orbit or beyond, the launching State shall register the space object by means of an entry in an appropriate registry which it shall maintain. Each launching State shall inform the Secretary-General of the United Nations of the establishment of such a registry.*
- Registration of space objects ensures trackability of objects launched into space and ascertains ownership.
- Compliance is not absolute, this could offer insights into the position of space objects for space situation awareness.



## SOFT LAWS/NON BINDING

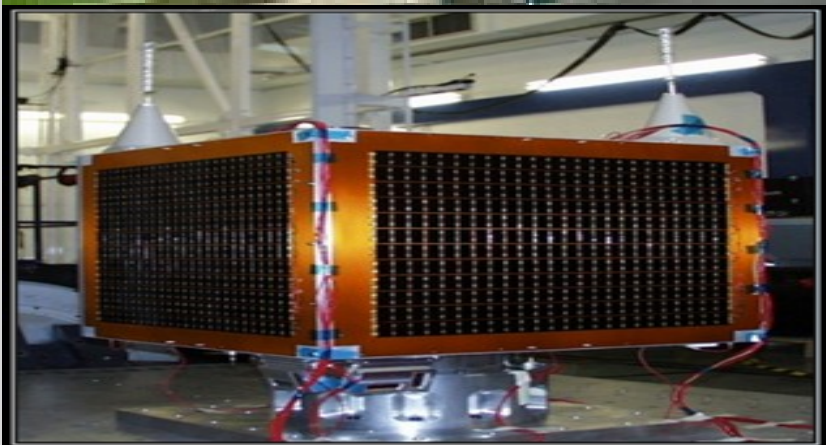
- UNCOPUOS guidelines for the long-term sustainability of outer space activities were adopted in 2019.
- Aimed at ensuring and enhancing the long-term sustainability of outer space activities, as understood at the international level and as set out in the guidelines, entails the need to identify the general context of, and modalities for, continuous improvements in the way that States and international intergovernmental organizations, while developing, planning and executing their space activities, remain committed to the use of outer space for peaceful purposes, so as to ensure that the outer space environment is preserved for current and future generations
- Coordination of activities related to the issues of man-made and natural debris in space.





# NIGERIA AS A CASE STUDY

NATIONAL SPACE RESEARCH AND DEVELOPMENT AGENCY



- In 1999 the National Space Research and Development Agency (NASRDA) was established.
- NASRDA is mandated to vigorously pursue the attainment of space capabilities as an essential tool for its socio-economic development and the enhancement of the quality of life of its people.
- The Agency is to achieve this mandate through:
  - research ,
  - rigorous education,
  - engineering development,
  - design and manufacture of appropriate hardware
  - and software in space technology.



# NIGERIAN SPACE POLICY

- In 2001, the Nigerian space policy was created.
- The Nigerian space policy is geared towards sustainability, and space capabilities to address environmental challenges. For instance, satellite technology can play a pivotal role in environmental monitoring. With the ability to provide critical insights into deforestation rates, pollution levels, and land use patterns, satellite data is invaluable for making evidence-based decisions. This information is key to protecting Nigeria's natural resources and biodiversity.

# Road Map for the implementation of the Nigerian Space Policy and Programme

TIME

2030



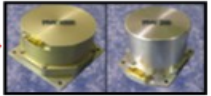
Launch of Nigerian Satellites from Nigerian Launch Pad (2030)

2028



Large Scale Commercialisation of Space Technology and Know-how (2028)

2026



Spin-Off of Allied Industries- Electronics, Software, etc. (2026)

2025



Development of Rocketry/Propulsion System (2025)

2018



Development and Building of Made in Nigeria Satellite (2018)

2015



Training of Nigerian Astronauts (2015)



AstroSAR (2015)

2011



NigeriaSat-2 (2011)



NigeriaSat-X (2011)



NigComSat-1R (2011)

2010



Building and commissioning of NigeriaSat-2 & Sat-x Ground Station (2010)

2007



Training of Nigerian Engineers in Ukrain and US on rocketry programme (2007)



Launch of NigComSat-1 (2007)

2006



Commencement of the Design of NigeriaSat-2 (2006)

MILESTONE





# NIGERIA'S APPROACH TO SPACE SUSTAINABILITY



## TECHNICAL

- Space Application
- Space Engineering.
- Space Science



## INTERNATIONAL COOPERATION

- Joint Project
- Bilateral and Multilateral Agreements.



## LEGAL

- NASRDA ACT 2010
- LICENSING REGULATION 2015
- Domestic register for space object

# OPERATIONAL CENTRES



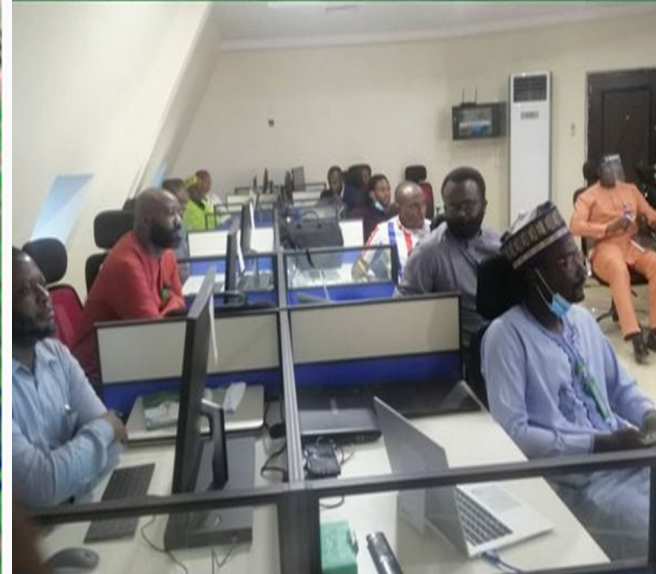


## NASRDA's Laboratories



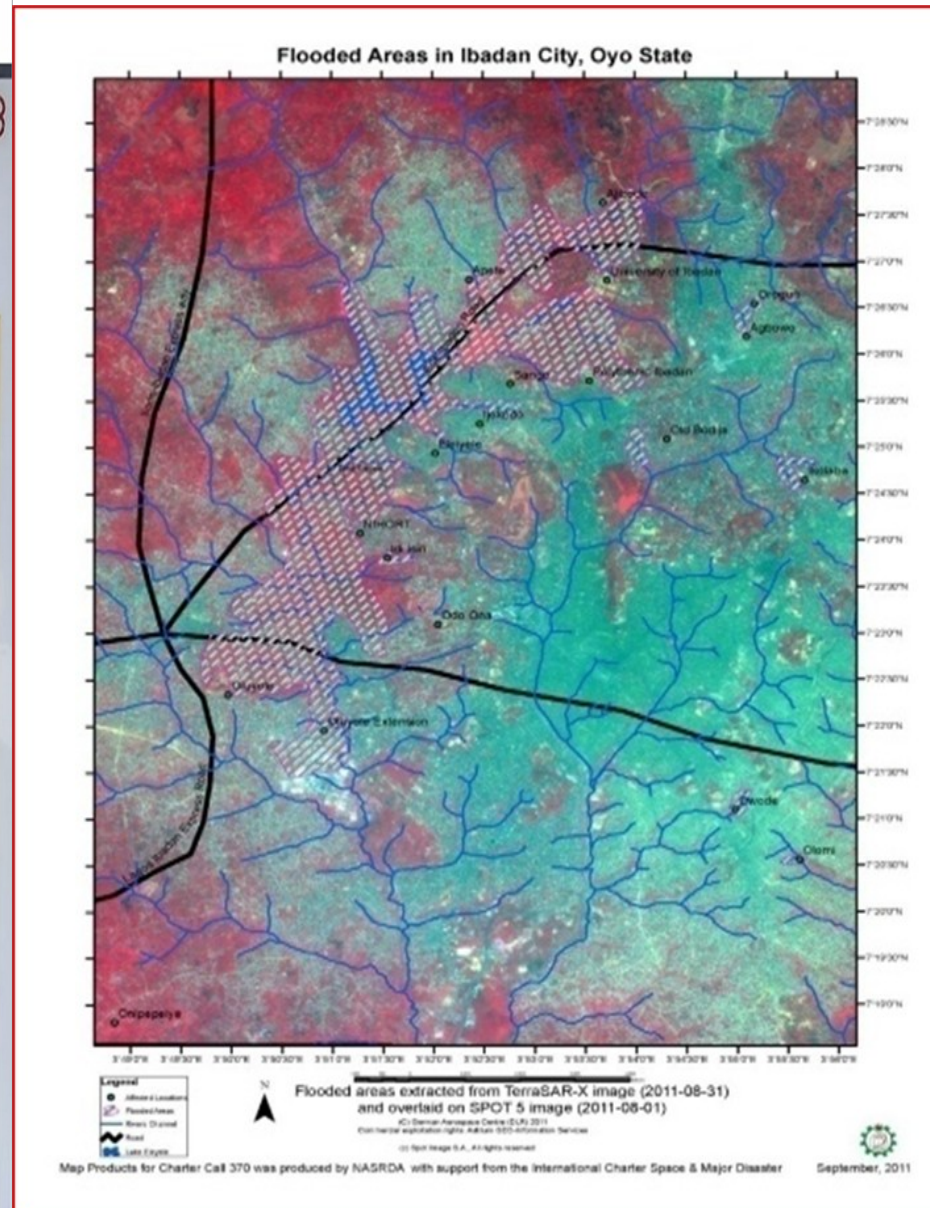


## GEO-REFERENCED INFRASTRUCTURE AND DEMOGRAPHIC DATA FOR DEVELOPMENT



The Geo-Referenced Infrastructure and Demographic Data for Development (GRID<sup>3</sup>) programme is part of a bigger global initiative which aims to improve access to data for decision making in all participating countries.

The project aims to increase access to geospatial data for use by Federal and State Government decision makers, as well as donors, non-profit organisations and private sector partners in Nigeria through the continuous availability of a robust and up-to-date GRID<sup>3</sup> geodatabase, Capacity Development, increase coordination in the collection and Management of geospatial datasets in Nigeria through the GRID<sup>3</sup> Portal







# NATIONAL SPACE RESEARCH AND DEVELOPMENT ACT 2010 (NASRDA Act 2010)

- The Act re-establishes NASRDA as the Government Agency responsible for regulating space activities in Nigeria
- Provides a licensing regime for space activities in Nigeria and further ensures compliance with existing International Space Legislation.
- In compliance with space debris management and sustainable use of space, a license for space activities within Nigeria is only granted subject to compliance with terms and conditions such as
  - Provision of details of the space object to be launched for adequate registration in both the domestic and the international register
  - prevent the contamination of outer space or cause adverse changes in the environment of the Earth,
  - Non-interference with the activities of others involved in the use of outer space



# REGULATION ON LICENSING AND SUPERVISION OF SPACE ACTIVITIES 2015

- The licensing regulation was created to ensure Nigeria's compliance with the international responsibility of authorisation and continuous supervision of national space activities.
- Creates conditions required to obtain an operating license for space activities in Nigeria.
- Sec 6(c)(d)(e) of the regulation requires compliance with certain terms and conditions before the issuance of an operating license.
  - Assurance that activities will not cause environmental damage to the Earth and outer space.
  - Mitigates Space Debris
  - Compliance with public safety standards.





# FUTURE DRAFT REGULATIONS

- Regulation for sustainable use of outer space
- Space Debris management
- Space Traffic Management
- Space situation awareness

Implementation of UNCOPUOS Guidelines on Long term sustainable use of space



# LEGAL BEST PRACTICES FOR SPACE SUSTAINABILITY

- Adherence to International Treaties: All space activities comply with existing international agreements.
- Development of National Legislation: Countries are encouraged to create laws that reflect international standards and address specific national concerns.
- Transparency and Information Sharing: Space-faring nations and private entities to share data on space activities and orbital positions.
- Implementing Debris Mitigation Guidelines: Developing and enforcing policies to minimize space debris creation.
- Encouraging Responsible Behavior in Space: Best practices for preventing harmful interference with the activities of other space actors.



## CONCLUSION

- Outer Space is a finite resource highly leveraged terrestrially for the day-to-day existence of humankind, hence its sustainability is a global responsibility
- Although UNCOPOUS long-term guidelines for the sustainability of space activities are non-binding, it is imperative for space-faring nations to incorporate the guidelines into their national space legislations to ensure adequate compliance and enforcement.
- The need for global cooperation and commitment to legal best practices for sustainable space development is essential to ensure the future of space activities.