

THE LEGAL FRAMEWORK ON SPACE EXPLORATION AND EXPLOITATION

BY

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ABSTRACT

The environment of the outer space has no friction so it allows stars, planet and moons to move freely along ideal gravitational trajectories. As against the popular belief, a person exposed to space would not explode, freeze to death or die from boiling blood as we now have human beings living in the outer space and not exposed to any imminent danger due to scientific research on how to live a normal life when in outer space. The essence of this paper is not to examine the science of space but how outer space became a legal subject. Due to space activities and exploitation that has affected every facet of human existence, several Laws, Treaties; Conventions have been put in place to regulate the activities of man on space. This paper will focus on space exploration, its effect on Earth, some Laws regulating human activities in outer space and its implications.

This paper will focus on the following legal regimes on Outer Space.

- 1. Treaty banning Nuclear weapon Tests in the Atmosphere, in outer space and under water often called the partial test ban treaty or Nuclear Test Ban Treaty of 1963*
- 2. Outer Space Treaty of 1967.*
- 3. Convention on international Liability for Damaged caused by space objects 1972*
- 4. Convention on Registration of objects launched into outer space (1975)*

5. *Agreement on the rescue of Astronauts, the return of Astronauts and the return of objects launched into outer space 1968*
- 6 *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies 1979*

INTRODUCTION

Outer space which is often referred to as space has been defined as the near –emptiness in which all objects in the universe move. The exploration and recent activities carried on in outer space can be said to be born out of human curiosity of what the earth, moon, planets, sun, stars and the galaxies would look and feel like and what can be exploited from it. Human beings have visited and even lived in space Stations for long period. Space exploration helps to see Earth in its true relation with the rest of the universe and such exploration could reveal how the sun, the planet and the stars were formed and whether life exists beyond our own world¹.

Up till the middle of the last century, neither man nor did machine have contact with space. The launching by the USSR in 1957 was a wake-up call for the U.S.A because the U.S. within three months² launched its first unmanned satellite “named explorer 1” which led to the creation of the National Aeronautics and Space Administration (NASA) as a result of space exploration awareness. In these early years of space exploration, success in space became a measure of a Country’s leadership in science, engineering, and National defense³. “Explorer 1” was smaller than “Sputnik”, but had more sophisticated instruments on board and discovered a pair of radiation belt⁴ which envelop the Earth.

¹ Oberg, James “space exploration” World Book Online Reference center 2004 world book line. See also Porter, Roy; Park, Katharine;Daston, Lorraine (2006). The Cambridge history of science: Early modern science. Cambridge University press P.27 ISBN 0521572444

² January 1958.

³ Andrea Thompson (09 April 2009). "Edge of Space Found". see also L. Sangalli, D. J. Knudsen, M. F. Larsen, T. Zhan, R. F. Pfaff, and D. Rowland (2009). *Journal of Geophysical Research* (American Geophysical Union) **114**: A04306

⁴ Later named Van Allen Belts

Ever since the space age started in 1957 there has been different launching of Satellites which includes communication Satellites in the Orbit, launching of Space Stations Modules and placing of weapons on the outer space.⁵

EFFECTS/IMPLICATIONS OF SPACE EXPLORATION

The number of Satellites launched since the first artificial satellite was launched has increased tremendously especially from the United State of America and Soviet Union (Russia), many countries including Japan, Canada, Brazil, Israel, China and Nigeria have also participated.

The functions of the Satellites vary and the launching continues. They range from Communication, Navigation, Weather forecasting, intelligence gathering, military reconnaissance and so on.

As said earlier, one of the greatest impacts of space exploration is on the business of communication, the transmission of wireless radio and TV Signals. Space based technology have become an essential part of daily life as we are able to watch direct satellite broadcasts of Ashes, use GPS systems in our cars, listen to weather forecast derived from remote sensing satellites and fly in aircraft that rely on satellite navigation.⁶

On the other hand, space exploration and Utility has resulted into dumping of debris on the Space and Earth surface thereby contributing to environmental hazards such as collision. As pile of the rubbish (unused equipments and parts of crashed spacecraft) fall off. A NASA scientist pointed out that debris from one collision could go on to create more and eventually an entire orbit would be rendered useless for generations. Activities of the astronauts on space like the construction and repairs of damaged satellites, space stations, modules and spacecraft, leaving on the space, waste from such repairs, fragments of paint to entire dead satellite and bits of old rockets and smashed space equipment orbit

⁵ Ed Jaffe, PHD, Wilmington “Exploration and Importance of Outer Space” www.shalomdelaware.org/emailarticle.html <http://www.nasa.gov/worldbook/index>. Accessed 2010

⁶ Freeland S and Lawyer D, Article in Sydney Morning Herald, July 20, 2009. <http://www.smh.com.au/opinion>

along with dropped items which include tools and odd gloves on the space can also result in the damage of spacecraft which eventually result in environmental damage both on the space and on earth surface⁷. Aside from the debris and hazard⁸ caused from the activities on space, space flight by aircraft most often causes debris to fall to the earth. This could occur from Aircraft crash either when lifting, landing or reentering the earth atmosphere. Example of such crash occurred in 2003 when a US shuttle broke apart over the South Western United State as it re-entered the Earth's atmosphere. The accident occurred about 16 Minutes before the shuttle was due to land, all the seven crew members died. After the disaster, NASA, halted shuttle flights and appointed an independent Commission to investigate the accident, the investigators collected thousands of pieces of shuttle debris that had fallen to earth after the accident.⁹

MILITARIZATION/WEAPONISATION OF SPACE

Outer space has been utilized as a means of militarization/weaponization by man. Satellites have been launched on space for purposes of military spy, placement of weapons by Nations for military or war advantages, placement of military spacecraft and large scale operation weapon in space. Space is also utilized as a temporary place to transmit weapons and testing/developing of weapons. About one fourth of the shuttle missions during the 1980's were said to be conducted for military purpose¹⁰

In order to regulate the activities of state on the outer space and its preservation, many International Treaties (multilateral and bilateral), Conventions and Principles have been adopted by States. The International legal regimes provide, amongst others, for non-appropriation of outer space by any Country, arms control, freedom of exploration, liability for damages caused by space objects, safety and rescue of spacecraft and astronauts, prevention of harmful interference with space activities and the environment, notification and registration of space activities, scientific investigation and the exploitation of natural resources and settlement of disputes¹¹

⁷ Op.cit. <http://www.cato.org/pubs/journal> Accessed 2010

⁸ Ijaiya H, Hassan Khafayat.Y (2012): challenges to environmental space laws. International Journal of environmental pollution, control and management. 4 (1) 117-127 published by India Institute of Technology, Kharagpur, West Bangal, India.

⁹ Op.cit

¹⁰ ibid

¹¹ United Nations Treaties And Principles On Space Laws. <http://www.UN.org>. Accessed 2010

The Treaties lay emphasis on the fact that activities carried on in outer space must be for the well being and good of mankind and also set out the International Legal Principles for common norms and behavior and the peaceful use of outer space.

INTERNATIONAL LEGAL REGIMES REGULATING ENVIRONMENTAL ASPECT OF OUTER SPACE

A) TREATY BANNING NUCLEAR WEAPON TEST IN THE ATMOSPHERE, IN OUTER SPACE AND UNDER WATER¹².

This Treaty was the first International treaty that specially and expressly involved the legal regulation of space activities. The treaty was drafted at the inception of both space exploration and nuclear development. The rational behind the adoption of this treaty include the fact that it is necessary to keep space free of nuclear force, nuclear pollution, nuclear explosions for both testing and non-testing purposes¹³ and the need to stop excessive release of nuclear fall out into the planet atmosphere. This became more pronounced after the United State successfully tested a hydrogen bomb and thermonuclear device with the power of eight megatons of TNT in early 1950s and when the USSR detonated a 50-megaton nuclear warhead in 1961.¹⁴

The parties to the Treaty are enjoined to prohibit, prevent and not to carry out any nuclear weapon test explosion or any other nuclear explosion. Article 1 of the treaty provides that:

“Each of the parties to this treaty undertakes to prohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion, at place under its jurisdiction or control:

a) In the atmosphere; beyond its limits, including outers space; or under water, including territorial waters or high seas; or

¹² Entered into force on 10th Oct, 1963. often called “Partial Test Ban Treaty (PTBT), Limited Test Ban Treaty (LTBT) OR Nuclear Test Ban Treaty (NTBT)”

¹³ Britton E, “The corpus juris spatialis” <http://www.suit101.com>

¹⁴ ibid

b) In any other environment if such explosion course radioactive debris to be present outside the territorial limits of the state under whose jurisdiction or control such explosion is conducted. It is understood in this connection that the provisions of this subparagraph are without the prejudice to the conclusion of a treaty resulting in the permanent banning of all nuclear test explosions, including all such explosions underground, the conclusion of which, as the parties have stated in the preamble to this treaty, they seek to achieve”

Suffice to say that this particular Treaty applies not only to the outer space but to atmosphere and under water. In fact, at the proposal stage, the Treaty intends to include banning of nuclear weapon test underground but the Soviet Union would only agree to test ban under water, outer space and atmosphere but not underground, a position the Western powers had long favored as an alternative to a more comprehensive underground environment ban. The intention to still accommodate banning of nuclear weapon underground is reflected in Article 1 (b). In essence, the provision could be deduced as a welcome to a future ban of nuclear text underground.

The essence of the treaty is only in Article 1 while the other 4 articles only provide for amendment of the treaty, ratification, withdrawal and the deposit of the English and Russian text of the treaty in the Archives of the depositary Government.¹⁵

The treaty however fails to ban other types of weapon except nuclear weapon coupled with the provision that suggest that the explosion should not be under the jurisdiction and control of a State, could one safely say that this provision is not applicable when the explosion occurs where no States has jurisdiction and control? The provision also failed to provide for sanctions in the event that one of the signatory States contravenes the provision of the treaty.

Another major defect of this provision is that it limits the test ban to a situation where the explosion would cause radioactive debris to be present outside the territorial limit of the State that has control and jurisdiction over the explosion without providing for remedy where the debris fall out to a State other than the State that has jurisdiction and control over the explosion.

¹⁵ See articles 2, 3, 4 & 5

Also what happens when the debris caused by the explosion is not radioactive in nature but other types of debris which could include parts of the missile or the weapon itself?

The only excuse for such lacuna could be an explanation as to the fact that the Treaty was clearly the first step towards a complete preservation of space for peaceful purpose as it was drafted at the beginning of both space exploration and nuclear development.

B. TREATY ON PRINCIPLES GOVERNING THE ACTIVITIES OF STATES IN THE EXPLORATION AND USE OF OUTER SPACE, INCLUDING THE MOON AND OTHER CELESTIAL BODIES.

1967¹⁶

This treaty is generally referred to as the “Outer Space Treaty” and was inspired by the prospects opening up before mankind as a result of man’s entry into outer space with the realization and belief that the exploration and use of outer space should be carried out for the benefit of all peoples irrespective of the degree of their economic or scientific development thus resulting and contributing to the development of mutual understanding and strengthening of friendly relations between states and people.¹⁷

The Treaty call upon States to refrain from placing in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction and from installing such weapons on celestial bodies which was adopted unanimously by the United Nations General Assembly on 17 October 1963.¹⁸

Article 1 emphasis that space exploration and use should be carried on for the benefit and respect of all Countries regardless of economic or scientific development and as such shall be the province of all mankind. Article 1 state thus:

¹⁶ Outer Space Treaty, adopted by the General Assembly in its resolution 2222 (XXI)), opened for signature on 27 January 1967, entered into force on 10 October 1967, 98 ratifications and 27 signatures (as of 1 January 2008)

¹⁷ Preamble to the “Outer Space Treaty”

¹⁸ ibid

“The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind”

Outer space, including the moon and other celestial bodies shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with International Law, and there shall be free access to all areas of celestial bodies.

There is freedom of scientific investigation in outer space, including the moon and other celestial bodies, and States shall facilitate and encourage International cooperation in such investigation. This provision allows for freedom of exploration on the basis of equality of States and for the benefit of States in accordance with International Law and free access to all areas of celestial bodies to the States. The Treaty allows for freedom of scientific investigation and research as long as it is not on selfish purpose but for the benefit of mankind.

Unlike airspace law¹⁹, states sovereignty over territorial Airspace to an unrestricted extent is not viable where space exploration is concerned. Beyond the point separating air from space, States have agreed to apply the International Law principles of *res communis*, so that no portion of outer space may be appropriated to the sovereignty of individual State.

Article 2 provides that “Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means”

The Treaty does not establish as such, a precise boundary between airspace and outer space but provides the framework for the International Law of Outer Space. In essence, no State is allowed to lay claim on all or any part of the outer space. The mere fact that space Stations are built in outer space where astronauts sleep and work does not mean that they are claiming to be the owner of that part of the space they occupy. Some commentators²⁰ have also noted that when the American flag was placed on the moon, that that did not indicate that the United States was claiming sovereignty over the moon.

¹⁹ See 1919 Paris Convention for the Regulation of Aerial Navigation which recognized the full sovereignty of States over the airspace above their land and territorial sea.

²⁰ Op.cit. <http://www.UNoosa.org/oosa/en/spacelaw/gares>

Therefore, Outer Space, which by the treaty includes the moon, and other celestial bodies, are common heritage of mankind.²¹

However, there are limited numbers of orbital slots requiring the separation of satellites apart, thus a limited number of satellites can be placed in geostationary orbit. This has resulted into conflict between countries wishing to have access to the same orbital slots (countries at the same longitude but differing latitudes). This led the countries located at the Earth's equator, to assert their legal claim²² to control the use of space above their territory²³

Article III reiterates that exploration and use of outer space will be carried out in accordance with International Law including the Charter of the United Nations, in the interest of maintaining International peace and security and promoting International co-operation and understanding. The provision of Article IV is one of the very important provisions of the Treaty as it deals with the prohibition of weapons on the outer space. The provision says that:

Without doubt, this provision is a development on the 1963 Partial Test Ban Treaty²⁴. The issue now is the adequacy of the provision despite the development, for the purpose of environmental protection. While the 1963 Treaty prohibits nuclear weapon testing alone, Article 4 places emphasis on the prohibition of placing of objects carrying nuclear weapons or any kind of weapons of mass destruction on the outer space. Can this be said to mean that where States test nuclear weapon in outer space temporarily or without placing the object used in carrying the weapon on the space, such provision will avail it? Especially since the provision did not state whether the placement prohibited is that of a temporary, permanent or outright placement prohibition. Also what happens where the actual weapon is placed in outer space and not the object used in carrying it to outer space.

²¹ Flakes J, The common heritage of mankind principle and the deep seabed, outer space, and Antarctica; will developed and developing Nations reach compromise. Wisconsin International Law journal. 2003;21:409

²² These countries have gone ahead to sign a Bogotá Declaration to that effect, though other states have vigorously protested against this and therefore cannot be taken as anything other than an assertion and a bargaining counter. See Shaw M.N, International Law, Fifth Edition, Cambridge University Press. 2003

²³ Thompson J. (1996) Space for rent: the International Telecommunications Union, Space Law, and orbit/spectrum leasing. Journal of Air Law and commerce, 62, 279-311. See also ESA-ECSL European centre for space Law-Geostationary Orbit, Legal issues.

²⁴ See article 1

According to Malcolm Shaw, there are disagreements as to the meaning of this provision,²⁵ he went further to say that the article bans only nuclear weapons and weapons of mass destruction from outer space, the Celestial Bodies and from orbit around the earth ,but Article 1 does emphasis that the exploration and use of outer space shall be carried out for the benefit and interest of all Countries and it has been argued that this can be interpreted to mean that any military activity in space contravenes the treaty²⁶. This paper disagrees a little with this argument because from the provision, one can deduce that the only military activity allowed by the article is where the military activity is necessary for the peaceful exploration in the areas which include deployment of military personnel for scientific research and peaceful purposes.

The Treaty however fails to prescribe sanction as to the contravention of this provision. Also, what would be the reaction where a non-State party places nuclear weapons on the Outer Space? This treaty also fails to define what peaceful purposes is within the context of the treaty, Does it include the use of nuclear weapon on/from the outer space to rescue people whose Country is plagued with war crimes and genocide as well as the UN's right of intervention under the UN charter?

The second paragraph of article 4 states that it is only the moon and other celestial bodies that must be used exclusively for peaceful purposes which has been interpreted to mean that (a) only aggressive military activity is banned (b) and that all military activity is banned.

Article 5 renders astronauts as envoys of mankind, who are to be assisted by States Parties in the event of an accident, distress or emergency landing on the territory of another State Party or on the high seas and are to be, after landing, safely returned to the State where their State vehicle was registered.²⁷

The Treaty further makes provision to ensure the peaceful use of outer space exploration. If a Party believes that the activity of another State Party would cause potentially harmful interference with the activities of other States Parties in outer space, in such a case, appropriate International consultations can

²⁵ This issue became particularly controversial in the light of the US strategic Defense Initiative (star wars), which aimed to develop a range of anti-satellite and anti-missile weapons based in space. The UN committee on the peaceful uses of outer space considered the issue, although without the participation of the US, which objected to the matter being considered: see e.g. 21(6) UN Chronicle 1984,p18

²⁶ Op.cit. P.482

²⁷ The 1968 Rescue Agreement (formally titled as the Agreement on the rescue of Astronauts, the return of Astronauts and the return of Objects launched into Outer Space) further expand the principles contained in article V of the outer space treaty

be called for,²⁸ and also that a State shall be liable for any damage caused to another State, by an object launched into outer space by that State.²⁹ Under article 8, States retain jurisdiction and control over personnel and vehicles launched by them into outer space while under article 7; they remain responsible for any damage caused to other Parties to the treaty by their space objects³⁰.

Finally, the activities of State Parties under the treaty in the exploration and use of outer space is to be guided by the principle of co-operation and mutual assistance with due regard to corresponding interest of all other States Parties to the treaty. Parties are also enjoined, in their space activities, to avoid harmful contamination as well as adverse changes in the environment of the earth as a result of the introduction of extraterrestrial matter and, to adopt appropriate measures for this purpose

Where a State Party is aware that its space activities is likely to cause potentially harmful interference with the space activities of another State Party, the former shall undertake appropriate International consultations before proceeding with any such activities or experiments.³¹

C) CONVENTION ON INTERNATIONAL LIABILITY FOR DAMAGE CAUSED BY SPACE OBJECTS.1972³²

The Liability Convention provides that launching State shall be absolutely liable to pay compensation for damage caused by its space objects on the surface of the earth or to aircraft and liable for damage due to its faults in space. This Convention also provides for procedure for the settlement of claims for damages. As of 1st January 2008, 86 States have ratified, 24 have signed the convention and three International Intergovernmental Organization (European Space Agency, European Organization for the Exploitation of Meteorological Satellites, and the European Telecommunication Satellite Organization) have declared their acceptance of the rights and obligations provided for in this agreement³³.

²⁸ Article IX

²⁹ Article VI

³⁰ Op.cit. Cheng B. Studies in space Law, chapter 17 and 18.

³¹ Op.cit

³² The "Liability Convention", adopted by the General Assembly in its resolution 2777 (XXVI)), opened for signature on 29 March 1972, entered into force on 1 September 1972, 86 ratifications, 24 signatures, and 3 acceptances of rights and obligations (as of 1 January 2008);

³³ Op.cit

This Convention has been said to be a demonstration of acceptance by the International community of International responsibility for activities in space,³⁴ as damage may on occasion be caused by space objects. The Convention is borne out of the consideration that though precautionary measures might have been taken by a launching State, damage may still be caused and as such there is need to elaborate effective International rules and procedures concerning liability for damage caused by space objects and to ensure in particular the prompt payment under the terms of this convention of a full and equitable measure of compensation to victims of such damage leading to the establishment of the rules and procedures to strengthen international co-operation in the field of the exploration and use of outer space for peaceful purposes.³⁵

Article 1³⁶ of the convention define damage to mean loss of life, Personal injury or other impairment of health or loss of or damage to Property of States or of persons, natural or juridical, or property of International Intergovernmental Organizations.

Article 2 provides for *absolute liability* to pay damages in respect of damage caused in the following words,

*“A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight”*³⁷

On the other hand, Article 3 provides for *fault liability* for the damage caused elsewhere or to persons or property on board a space object.³⁸ Hence, in the event of damage been caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object of another launching State, the later shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible. while article 4 provides *joint liability* of the two launching States where the damage caused to the third State on the surface of the earth or to aircraft in flight, their liability to the third State Party shall be absolute but where the damage has been caused to a

³⁴ Britton E, “The corpus juris spatialis” <http://www.suit101.com>

³⁵ Preamble

³⁶ Definition section

³⁷ See Articles VI & VII Outer space Treaty 1967

³⁸ Op.cit. P483

space object of the third State or to persons or property on board that space object elsewhere than on the surface of the earth, this responsibility to the third state shall be based on the fault of either of the first two states or on the fault of persons for whom either is responsible.

The burden of compensation for the damage shall be apportioned between the first two States in accordance to the extent to which they were at fault. If the extent of liability the two States cannot be established, the burden of the compensation shall be apportioned **equally** between them and this does not preclude the right of the third party to seek the entire compensation due under this Convention from any or all of the launching States which are jointly and severally liable³⁹.

The provision of the Convention does not apply to damage caused by a space object of a launching state to

(a) Nationals of that launching State

(b) Foreign Nationals during such time as they are participating in the operation of that space object from the time of its launching or at any stage thereafter until its descent or during such time as they are in the immediate vicinity of a planned launching or recovery areas as the result of an invitation by that launching State.⁴⁰

This liability Convention was invoked by Canada in 1979 following the damage allegedly caused by Soviet Cosmos 954. The claim was for \$6,401,174.40.⁴¹

Finally, Article 6 provides an exemption from absolute liability where the Claimant State, or the Natural or Juridical persons it represent, caused the damage wholly or partly by gross negligence, or by an act or omission done with intent to cause damage.

D) CONVENTION ON REGISTRATION OF OBJECTS LAUNCHED INTO OUTER SPACE 1975⁴²

Generally referred to as Registration Convention and contributing immensely towards the preservation of outer space for peaceful purpose. According to Ijaiya;⁴³ the Convention has two essential functions.

³⁹ See generally Article II, III, IV and V

⁴⁰ Article VII.

⁴¹ Christol, International liability for damage caused by space objects; 74 AJIL, 1980, Pg. 346

⁴² The Registration Convention was adopted by the General Assembly in its resolution 3235 (xxix), opened for signature on 14th July 1975, entered into force on 15th September 1976. 51 ratification, 4 signatures and 2 acceptances of rights and obligations (as at January 2008)

The first, that it is not possible to identify a Spacecraft that has caused damage without a system of registration. Secondly, that a well-ordered and complete informative system of registration would minimize the likelihood and even the suspicion of weapons of mass destruction being furtively put into orbit.

The Convention lay down series of stipulations for the registration of information regarding space objects such as the purpose of the space object, location and parameters, with the United Nations Secretary-General.

“when a space object is launched in 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”

Each is to furnish to the UN Secretary-General information concerning each space object carried on its registry including,

- (1) The name of launching State or States
- (2) The appropriate designation of the space object or its registration number
- (3) The date and territory or location of launch
- (4) The basic orbital parameters which include nodal period, inclination, apogee and perigee.
- (5) The general function of the space object⁴⁴

The Secretary-General of the United Nations is to maintain a Register in which the information furnished in accordance with the article 4 is recorded which the register shall be accessible at all time.

However, despite compliance with registration of object by a State under this Convention and a State still finds it difficult to identify a space object that has caused damage to it or any of its natural or juridical persons or which may be of hazardous or deleterious nature, other States including States possessing space monitoring and tracking facilities shall assist in the identification of the object. The

⁴³ Ijaiya H. The Legal Regime Regulating The Environmental Aspect Of Outer Space. 7th International Conference of Indian Society of International Law. Rahmallah Khan (ed.) 559-569, Published by the Indian Society of International Law, New-Delhi, Indian. See also Ijaiya H, Hassan K.Y (2012): challenges to environmental space laws. International Journal of environmental pollution, control and management. 4 (1) 117-127 published by India Institute of Technology, Kharagpur, West Bangal, India

⁴⁴ See article IV

State Party needing the assistance is to submit information as to the time, nature and circumstances of the events giving rise to the request for assistance.

E) AGREEMENT ON THE RESCUE OF ASTRONAUTS, THE RETURN OF ASTRONAUTS AND
THE RETURN OF OBJECTS LAUNCHED INTO OUTER SPACE 1968.⁴⁵

The Agreement sets out the Legal framework for the provision of emergency assistance to astronauts.⁴⁶ It makes provisions as regards the immediate notification of the launching authority or public announcement regarding astronauts in distress as well as immediate assistance. The Agreement also covers the search and rescue operation and prompt return of the astronauts and recovery of space objects. The purpose and essence of the Agreement is to call on States Parties to render all possible assistance to astronauts in the event of accident, distress or emergency landing, prompt and safe return of astronauts and the return of space objects launched into outer space which is prompted by sentiments of humanity especially with the hazards of astronomy.

Article 1 provides that;

“Each contracting party which receives information or discovers that the Personnel of a spacecraft have suffered accident or are experiencing conditions of distress or have made an emergency or unintended landing in territory under its jurisdiction or the high seas or in any other place not under the jurisdiction of any State shall immediately;

(a) notify the launching authority or, if it cannot identify and immediately communicate with the launching authority, immediately make a public announcement by all appropriate means of communication at its disposal;

(b) notify the Secretary-General of the United Nations, who should disseminate the information without delay by all appropriate means of communication at his disposal”

⁴⁵ Rescue Agreement, adopted by the General Assembly in its resolution 2345 (XXII), opened for signature on 22 April 1968, entered into force on 3 December 1968, 90 ratifications, 24 signatures, and 1 acceptance of rights and obligations (as at 1 January 2008);

⁴⁶ See also article V, Outer Space Treaty 1967

Where a contracting State notices that a spacecraft had landed by accident or in distress in the territory under its jurisdiction, the contracting State is enjoined to take all necessary steps to assist and rescue the astronauts and shall also inform the launching authority and the UN Secretary-General of the steps it is taking and the progress so far. If there would be need for the help of the launching authority for the effective rescue and search operation, the launching authority shall co-operate with the contracting party and such operation shall be subject to the direction and control of the contracting Party, which shall act in close and continue consultation with the launching authority.⁴⁷

Expenses incurred in the search and rescue mission to recover and return a space object or its component parts shall be borne by the launching Authority.⁴⁸ Launching Authority has been defined to refer to the State responsible for launching, or, where an International Intergovernmental Organization is responsible for launch, that Organization, provided that that Organization declares its acceptance of the rights and obligations provided for in this Agreement and a majority of the States Members of that Organization are contracting parties to this Agreement and to the Treaty on Principles Governing the activities of States in the exploration and use of outer space, including the moon and other Celestial Bodies.

F) AGREEMENT GOVERNING THE ACTIVITIES OF STATES ON THE MOON AND OTHER CELESTIAL BODIES 1979⁴⁹

Generally referred to as the Moon Treaty, like the Outer Space Treaty of 1967, the Moon Treaty also emphasizes that the Moon and its natural resources are **common heritage** of mankind and are not subject to national appropriation by any means.⁵⁰ In effect, a State cannot lay claim of private rights of ownership over the Moon or any part of it or its natural resources, though all States Parties have the right to exploration and use of the moon. One may be little confused as to the application of the Moon Treaty to outer space, for clarification article 1 of the treaty provides that:

⁴⁷ See article II

⁴⁸ See article V

⁴⁹ Moon Agreement or Treaty, adopted by the General Assembly in its resolution 34/68, opened for signature on 18 December 1979, entered into force on 11 July 1984, 13 ratifications and 4 signatures (as of 1 January 2008).

⁵⁰ Article XI

- 1 *“The provision of this agreement relating to the moon shall also apply to other celestial bodies within the solar system, other than the earth, except in so far as specific legal norms enter into force with respect to any of these celestial bodies*
2. *For the purpose of this agreement reference to the moon shall include orbits around or other trajectories to or around it.*
3. *This agreement does not apply to extraterrestrial materials which reach the surface of the earth by natural means”*

Other Celestial Bodies could be said to include the Outer Space. Article 3 provides for the demilitarization of the moon and other celestial bodies, although military personnel may be used for peaceful purposes, and reiterates the principle established in the 1967 Outer Space Treaty.⁵¹

The Treaty prohibits the use of the moon for the purpose of threat or use of force or any other hostile act or threat of hostile act and in relation to the earth, moon, spacecraft, and the personnel of spacecraft or man-made space objects.⁵² The Treaty also prohibits the militarization of any form on the moon. States Parties are also enjoined to take measures in the exploration and use of the moon to prevent the disruption of the existing balance of its environment whether by introducing adverse changes in the environment, by its harmful contamination through the introduction of extra environmental matter or others. Parties are to avoid harmfully affecting the environment of the earth through the introduction of extraterrestrial matter or otherwise.⁵³ The rules on environmental protection under article vii did not give any definition of harmful contamination and appropriate protection measure.⁵⁴

Unlike the Outer Space Treaty, the Moon Treaty does not prohibit placement of radioactive materials on the Moon but only that the UN Secretary-General should be notified in advance of all such placement.⁵⁵

NATIONAL LAWS

Aside the International Legal Regimes,⁵⁶ some States have also made Laws to regulate their own activities on Space. Example of such States includes China⁵⁷ and United States of America. In china, a

⁵¹ 1967
⁵² Article III(II)
⁵³ See article vii
⁵⁴ Op.cit. pg209-10
⁵⁵ Ibid. See also article vii(ii).

variety of detailed rules and regulations published by several states regulatory agencies presently govern China's space activities. National Policies and States Laws which have the authority of Constitutional status are passed by the National Peoples Congress e.g. Interim Measures on the Administration of Permit for Civil Space Launch Projects 2002⁵⁸. Article 1 provides that

“The present measures are formulated with a view to regulating the administration of civil space launch project, promoting the healthy development of civil space industry, maintaining the state security and the public benefits and, performing the obligations of china as a contracting state to the International outer space Convention”

The United States congress has also passed Laws in the regulation of the activities on outer space. These laws include the Space Commercialization Promotion Act Of 1966⁵⁹ which is passed to encourage the development of a Commercial Space Industry in the United States, and for other purposes. And Space Transportation Services Purchase Act 1993⁶⁰

Though Nigeria is a signatory to most of these International Treaties and Conventions on Outer Space, coupled with its interest in launching satellites,⁶¹ she is yet to pass a Law specifically on Outer Space activities.⁶² However, a number of Nigerian domestic laws on Insurance, Communications, Intellectual property/database protection and export controls, can be extended to space related activities.

For instance, some portion of the provisions of the **Insurance Act 2003** provides that part of the re-insurance pertaining to assets such as satellites, underwritten by foreign insurance companies, must be placed with Nigerian underwriters.

⁵⁶ Op.cit. See also <http://www.wsichina.org/space/program>.

⁵⁷ Op.cit. See also <http://worldsecurityinstitute.org>

⁵⁸ Decree of the Commission of Science, Technology, & Industry for National Defense of the People's Republic Of China No 12. Entered into force on the 21st December 2002. See also <http://www.fdi.gov.cn/pub/FDI-EN/Laws/default.htm>

⁵⁹ (HR3936)

⁶⁰ (HR2731)

⁶¹ Nigeria has launched up to three satellite since 2003 for different purposes including for disaster monitoring constellation(DMC)

⁶² Momoh W. “An abstract on the overview of Nigeria space activities and space Law” <http://www.space.gov.za/conferences/alc2007/programme/momoh>

The Nigeria Communication Commission which administers the provisions of the **Communications Act of 2003**, has the sole and exclusive power to manage and administer the radio frequency spectrum for the communications sector and in that regard to grant licenses for and regulate the use of the said radio frequency spectrum.⁶³ It is a fact that satellite communications rely upon the use of radio frequency spectrum for signal transmissions. On the protection of remotely sensed data, the **Copyright Act**⁶⁴ contains provisions and policy statements to protect intellectual property, arising from remotely sensed data.

Furthermore, the **Fire Arms Act**, Cap146 regulates amongst others, the use, import and export of artillery and rocket weapons (which would encompass space launch vehicles)⁶⁵

Nigeria's first satellite was launched into orbit on 27 September, 2003 as an earth observation satellite called the NigeriaSat-1 with a five years life span. The encouraging successes recorded from the NigeriaSat-1, resulted in further investment by federal government in a communication Satellite code-named as NIGCOMSAT-1 and a second earth observation satellite, Nigersat-2 launched.⁶⁶

NigeriaSat-1 images have been used to address issues in virtually every facet of our national life. Also through the Disaster Monitoring Constellation (DMC), images have been made available worldwide for the management of disasters. The Director-General⁶⁷ of NASRDA,⁶⁸ however, identified some of the burning issues in space development to include strategies for the long-term security of space operations in a more crowded and more militarized environment, development of voluntary guidelines for space debris mitigation, discussion on possible "rules of the road" for space operations, as well as other issues

⁶³ It is interesting to note here that though the private entity established by the Nigerian Government to operate the Nigcomsat-1 communications satellite is subject to the provisions of the Nigerian Communications Act of 2003 as far as the use of radiofrequency spectrum is concerned, it's day to day operations would ordinarily be governed by those guidelines put in place for the operations of state owned companies under the Federal Ministry of Science and Technology, as stated in the Nigerian Federal Civil Service Circular - Reference No. SGF/OP/IS.3/T.1/142 of 2nd August 1999.

⁶⁴ Cap 68, LFN 1990

⁶⁵ Op.cit

⁶⁶ Op.cit. <http://allafrican.com/nigeria>, FG Lauds Nigeriasat-1 in orbit

⁶⁷ Seidu Mohammed

⁶⁸ National Space Research And Development Agency

such as cooperative space exploration. Others, he cited to include analysis of long-term sustainable space activities, development of potential legally binding space rules, processes for avoiding interference or collision in space, and strategies for preventing space from becoming an area of conflict.

Nigeria's interest in space activities also informed The United Nations Office for Outer Space Affairs (OOSA),⁶⁹ within the framework of the United Nations Programme on Space Applications, to organize a four-day Workshop on Space Law titled "Meeting international responsibilities and addressing domestic needs". The Workshop was co-organized and hosted by the Government of Nigeria, and was held in Abuja, Nigeria, 21 - 24 November 2005. It is the fourth in a series of workshops organized by OOSA that aim at building capacity in space law.⁷⁰

CONCLUSION

Having discussed on the exploration and use of outer space especially in the area of communication, the Legal regimes (both International and National) regulating the outer space, it is pertinent to point out the fact that there still exist the problem of boundary delimitation, that is, where does the States sovereignty over airspace stops? Is it immediately one could not feel air above the earth or is there a point in the air space where states sovereignty stops? Unfortunately none of these Treaties has given us the delimitation of space and airspace. This is regarded as one of the lapses of the present Laws regulating the outer space. It is therefore recommended that these Treaties be amended to state/give a clear boundary between the space where the concept of sovereignty is not applicable and the airspace in which States retain domain. There is also the need for a legal definition of outer space.

⁶⁹ Op.cit. <http://www.oosa.unvienna.org>

⁷⁰ Op.cit. <http://www.spaceref.com> United Nations Holds Space Law Workshop In Nigeria Press release, Nov, 18 2005. UN Office For Outer Space Affairs

Further more, the increase in the use and launching of satellites at the geostationary orbit has put a lot of pressure on this part of the outer space where satellite circle at the same speed as the earth rotates. This is the only orbit that is capable of providing continuous contact with ground stations through a single satellite and thus a finite resource. Because of the limited nature of this part of the space there is need for urgent action to produce an acceptable series of principles governing its use.⁷¹

In response to whether the relevant laws in force in Nigeria vis-à-vis her international obligations adequately balance various interests in outer space and space activities, one can state that though the current framework is not entirely appropriate, there are legal prescriptions under which space activities can reasonably be operated. The gaps and or perceived problems in the legal framework stem primarily from the involvement of private entities, which as it has been contended, is because, pursuant to Article VI of the Outer Space Treaty; ... *“The activities of non-governmental entities in outer Space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty.”*

One expert is of the view that the best way for States to exercise legal control over the activities of private entities would be through the establishment of a licensing system as part of a National space Law, which would provide for necessary controls and safeguards.⁷² This is stated alongside the fact that it should be left to the International level to define the parameters and scope within which such control of private space activities should take place.⁷³

⁷¹ Op.cit

⁷² Frans G. Von der Dunk, Public space and Private Enterprise – The Fitness of International space law Instruments for Private space Activities, op. cit. for a thorough analysis of the issues arising on public space law and private enterprise

⁷³ Ibid