THE REGULATORY FRAMEWORK OF THE RADIO FREQUENCY SPECTRUM UNDER INTERNATIONAL LAW*

Abstract
The Radio Frequency Spectrum (R.F.S) is the entire range of wavelengths of electromagnetic radiation in the frequency range of 3 kilohertz (KHZ) to 40,000 megahertz (MHZ). The RFS is arbitrarily divided into a number of wavebands, from very low frequencies (long wavelengths) to ultra-high and microwave frequencies (short wave lengths)[1]. In radio transmission, signals from the transmitting aerial can reach the receiving aerial by means of ground waves, sky waves (which are reflected by the ionosphere of the upper atmosphere) or by reflection or retransmission from a communication satellite.[2] The RFS is a limited resource but very vital to global communication. The need for global communication is as old as the history of mankind. In conditions of modern technical progress, it increasingly constitutes a global social reality. The law of global communication appears as the regulatory response to this need; a response in terms of rules of conduct which are meant to put the mechanism of world communication into proper shape. In this paper, we shall discuss the background to the establishment of the legal framework for the R.F.S. under international law by looking at the peculiar characteristics that inform the basis for the formulation of its legal framework. We shall also look at its regulation and the procedure for such regulation. The paper will be concluded with an appraisal of the entire regulatory framework while considering the problems and suggestions for improvement.

INTRODUCTION

Background to the legal regime of the radio frequency spectrum

Radio Frequency Spectrum is a scarce natural resource that is vital to all countries. It is an important resource not only for the broadcasting and communication sectors but also for transport, security, scientific and leisure sectors. Due to the increase in world communications created by explosion in variants of communication technologies, the available limited supply is further depleted.

When the spectrum was discovered in the 19th century by the succession of British physicists: James Maxwell (1864), Hertz (1888) and Marconi in 1896, the only limit to the resource was man's inability to cope with technical enormity of the task of spectrum utilization. In the 19th century, (1895), the invention of the radio brought dramatic changes in telecommunication. Though radio was initially regarded as an advanced form of telegraph, it was soon realized that it opened up new possibilities for quicker and accurate information.[3]

There were also problems with this new invention. In 1912, a ship (the "Titanic") sunk, claiming 1,513 victims. Many lives could have been saved if the Titanic's radiotelegraph operator succeeded in his frantic and repeated attempts to communicate with a ship within rescue distance. After the tragedy, it became clear that if radio communications were going to be used, especially at sea, international regulations of the frequency spectrum were necessary.[4]

The situation changed drastically in the later part of the 20th century. Equipments capable of operating in further reaches were developed. A new form of radio service began in the form of

* **Okonkwo, Obi Peter**, LL.M (Ife) Lecturer, Department of Jurisprudence and International Law, Faculty of Law, Anambra State University, Igbariam Campus; 08037025761; e-mail: obiajuru_2001@yahoo.com

1 . **Oxford Encyclopaedia** , edited by Alan Isaacs, Elizabeth Martin, Jonathan Law et.al., 1998, p.1124

2 . *Ibid*. p.1125

3 . Monica Guitestam, "ITU- 125 years old: at the cutting edge telecommunications" UN. Chronicle, Sept. 1990, p. 4

4 . *Ibid*. p.5

broadcasting. The problem since the 20th century shifted from man's lack of vision in finding more need for utilization of the spectrum and the attendant technical capacity, to how to use it effectively, efficiently and judiciously.[5] This gave rise to a problem that still remains one of the biggest problems in the usage of the spectrum i.e. how to share radio frequencies without interference between stations. Consequently, there arose the need to regulate and apportion the spectrum to contending users.

Characteristics of the radio Frequency Spectrum

The utilization of the various segments of the spectrum in performing different and specalised tasks highlighted some characteristics peculiar to the spectrum vis-à-vis other natural resources like water, minerals, fossil fuels etc. Some of the peculiarities are as follows:

- The spectrum wastes when it is not being used. Consequently, segments of it are located for 'predicted' but 'yet improved' means.
- The resources have dimensions of space, time and frequency which are all interrelated. The dimensions of time and frequency permit the use of the resource in several geographical areas depending upon the specific physical propagation and peculiar characteristic of the particular frequency chosen. Similarly, time and frequency are interchangeable in the same area. Dimension of time alone can also permit usage of the spectrum where geographical factor cannot be used to an advantage.
- The R.F.S. is an international resource, which is available to all. No state can operate solely under its own scheme of allocation. Though a state can interfere with spectrum allocated to a neighbour, it would equally suffer from a similar interference by that other state. This would lead to a waste of resource and such waste can be multiplied to all levels of such interference around the world.
- It is wasted when assigned to do a task that can be done as easily in other ways. There are many cases today where radio is being used to perform tasks that can be performed as easily and perhaps more economically through cable or wire. Conversely there are situations such as communication to moving vehicles that can be conducted reasonably by any other means than through the radio.
- The spectrum is wasted when its parameters are not correctly applied to a task. The parameters are allocated primarily for local broadcast purposes but they are particularly susceptible to sky wave transmission thus creating interferences far beyond the local area at night time.
- It is subject to pollution. Radio noise, the curse of electrical civilization, is in fact polluting and decreasing the utility of some segments of the spectrum.

Regulation of the Radio Frequency Spectrum

A regulatory framework for the spectrum will be without foundation if states do not collaborate in a wholesome effect to exploit the benefits of the global resource.

The Need for Collaboration

Primarily, states collaborate in the field of telecommunication in order to establish an effective regulation of the R.F.S. which is the livewire of global communication. In other words, regulation would be very difficult to attain if states do not collaborate. Multilateral or indeed

[5] The Joint Technical Advisory Council of the Institute of Electronic Engineers and the Electronic Industry Association, "Radio Spectrum Utilisation; a program for the administration of the radio spectrum", 1965, pp. 3 and 6

potentially universal or quasi universal legal instruments are more beneficial than bilateral agreements due to teleological development in the field of communication. The need for international collaboration is obvious in few fields of international law as it is in communication due to the following reasons:

a. Technological development has enormously enhanced man's ability to transmit increasingly complex messages rapidly across long distances, and at substantially decreasing cost. This involves sending messages across national borders and into territories of sovereign states which would, if there is no collaboration assert their right of sovereignty. These data and messages are transmitted at such high speed that hesitation by a state for a second on whether to interfere or not would truncate the entire spectrum.
b. The issue of sovereignty of a state over the operational space of radio communication has made international collaboration in the field of telecommunication inevitable.
c. Global communication enhances world trade and world economy. Transboundary trade will thus be hampered without trans-border communication with the consequent problem of misallocation of the scarce frequency spectrum.
d. Utilisation of the radio spectrum includes the use of remote sensor by satellite. Collaboration is required, otherwise consent of the sensed state and other states through which the senor passes would not be obtained irrespective of an existing rule or regulation

Method of Regulation of the Radio Frequency Spectrum

We have discussed some peculiarities of the radio frequency spectrum, which make regulation inevitable. The most peculiar feature is the fact that radio waves do not stop at boundaries. For effective development of the spectrum, domestic laws and regulation on its utilization can only be effectively developed within an overall framework of international agreements. There is therefore the need to regulate and apportion the spectrum to contending users.

The regulation of the R.F.S. is usually through a *regulatory agency* and *international legal instruments*

The International Telecommunication Union; the regulatory Agency for the R.F.S.

The general regulations guiding the R.F.S. were made under the auspices of the United Nations Committee on the Peaceful Uses of Outer Space. Unfortunately, the Committee lacks the permanence and dedicated structure of organs like the International Civil Aviation or the International Maritime Organisation.

The stage of regulation by such organ with a feature of permanence and dedicated structure was set with the formation of the International Telecommunications Union (I.T.U). The regulations set down by the I.T.U thenceforth constituted an independent legal regime of telecommunications. However, the major principles of the ITU regulations take account of the principles embedded in international legal instruments.

The ITU now plays a regulatory role in allocation of broadcasting communication wavelengths to orbital positions available for satellites. ITU is one of the oldest agencies of the United Nations Organisation, if its origin is traced back to the International Telegraph Convention signed in Paris in 1865.

The history of the ITU also records that when telegraphy became available to the general public, 10 years after Morse sent the first message over a telegraph in 1844, international communication by that means was not possible. The absence of international communication was due to the fact that each country used a different system with separate and individualized telegraph code to safeguard the secrecy of its military and political messages.[6] Twenty European states, conscious of these factors got together and established an institution to facilitate collaborative efforts towards regulating world e-communication.

When the telegraph service reached the international level at the beginning of the 19th century, it became necessary to regulate the use of equipment, coding and rates. A legal regime was also needed to protect telegraph wires which were by then crossing international borders. The European states thus drew up the first set of Telegraph Regulations. This led to the birth of the International Telegraph Union. In 1932 at the Madrid Conference, the Union was merged with the International Telegraph union and was renamed the International Telecommunication Union (I.T.U.). Thus the inaugural spirit and intention behind the establishment of the I.T.U. was the necessity for collaboration among states in ensuring world communication which is free from rancor and frictions.

In the last 40 years, from the Administrative Radio Conference in 1963 and up to and including the last World Radio Communication Conference in Geneva in 2007[7], many ITU conferences have addressed the regulation of the usage of the space radio communication services established for the frequency spectrum through the constitution, conventions and the Radio Regulations (R.R) of the ITU.[8]

The regulations are based on the main principles of efficient use and equitable access to the spectrum resources as laid down in the following words of the ITU Constitution:

> In using frequency bands for radio services, members shall bear in mind that radio frequencies and any associated orbits, including Geostationary-satellite orbits are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the Radio Regulations, so that countries or group of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries. [9]

Functions of the I.T.U.

The mandate of the ITU as defined in the International Telecommunication Convention negotiated in 1965 is *to maintain and extend international cooperation for the improvement and rational use of the telecommunication of all kinds.*[10]

[6] Richard K. Gardner, **International Law,** Pearson Education Limited, England, 2003 p.209

[7] . The ITU organises World Radio Conferences (W.R.C.s) every four years in order to update Radio Regulations in response to rapid changes in technological developments. During such conferences, member states of the I.T.U. negotiate rules for usage of the radio frequency spectrum.

[8] . Yvon Henri "Orbit/Spectrum Allocation Procedures Registration Mechanism. http:/www.itu./itu-R/conference/seminar/Geneva-2006/docs/ E/01-orbit-spectrum_allocation_YH.doc.

[9] . Constitution of the ITU. No. 196, Art. 44

[10]. *Ibid*. p. 9. Art.4

The main tasks of the 166-member union are to promote international cooperation and to foster technical development in the telecommunication field with a final goal of making those services more efficient, useful and available to the public. The specific functions are as follows:

- Allocation of the radio frequency spectrum and registration of radio frequency assignments.
- Fostering collaboration with respect to the establishment of the lowest possible rates.
- Coordination of efforts to eliminate harmful interference among radio stations of different countries and to improve the use of the radio frequency spectrum.
- Fostering the creation, development and improvement of telecommunication equipment and networks in new or developing countries by every means at its disposal, especially its participation in the appropriate programmes of the United Nations.[11]
- Promotion of the adoption of measures for ensuring the safety of life through the cooperation of telecommunication services.
- Undertaking studies, making recommendations, adoption of resolutions, formulation of recommendations and opinions, collection and publication of information concerning telecommunication matters for the benefit of all members and associate members.

The I.T.U. uses the International Frequency Registration Board (IFRB) to coordinate, administer, incorporate and enforce the rules that govern the use of the radio frequency spectrum. The IFRB introduced a Table of Frequency Allocations in 1912.[12] This table sets out specific frequency bands allocated to each type of service using radio waves, with a view to avoiding interference between transmitting stations. At present the table of allocations takes account of advances in technology and now includes communication between aircraft and control towers, ships at sea and coast stations, spacecraft and earth-based stations and mobile telephones.[13]

While certain frequency bands are allocated for specific purposes like maritime, broadcasting, aeronautical radio navigation, e.t.c., some are made on a global basis while others vary among the regions.

In advanced military operations, resort is usually made to the table of frequency allocations. In 2004 the data bandwidth military requirements of the United States of America in "operation Iraqi freedom" was 2.4 billion bits per second.[14] The organic bespoken frequency capability of the military could not carry such heavy traffic and resort was had to satellite communications.

[11]. In 1989 the Telecommunications Development Bureau was set up to strengthen technical assistance to developing countries. The Bureau implements projects financed by the U.N.D.P. it also coordinates technical cooperation and assistance activities.

[12]. The table divides the spectrum into bands for about 40 categories. It divides the world into three regions: -Europe and Africa (region 1), North and South America (region 2) and Asia and Australia (region 3). Within these regions, countries are free to allocate frequencies as they see fit.

[13]. Richard Gardner, *op.cit*. p.210.

[14]. Walter Ellis, **"Issues of military use of Radio Frequency Spectrum"**: A paper presented in partial fulfillment of the requirements of Space Studies 565, Space law, Department of Space Studies, University of North Dakota, February 28, 2006.

The ITU works with other specialist organisations, such as the International Mobile Satellite Organisation. It also takes account of the development of international law for outer space in the use of the radio spectrum in conjunction with satellites in the geostationary orbit.

International Legal Instruments

International law plays an important role in the regulation of the use of the RFS. It does this through the use and application of relevant international legal instruments like the instruments of the United Nations Organisation, Constitution of the ITU, conventions, regulations, recommendations, protocol and regional agreements. National administrations supplement these agreements in their management of the spectrum.

The development of the basic code of space law was developed more rapidly than other areas of international law. This is principally because most of the codes of outer space law were anticipatory and prospective in the sense that they provided against future possibilities that affect only a limited number of states that have space capability. This contrasts with the other specialist areas of international law like maritime, international economy or immigration and refugee law where instruments were signed to cover ad-hoc matters of daily currency.

Many satellites, which are in the outer space, control modern communication technology including the radio frequency spectrum. These satellites can be appropriated by states and international organisations. This appropriation is most prevalent and consistent in the creation of telecommunication networks. Appropriation of the outer space is regulated by international legal instruments.

The legal instruments contain the main principles and lay down the specific regulations governing the following elements:

- Allocation of frequency spectrum to different categories of radio communication services.
- Rights and duties of member administrations in obtaining access to the spectrum/orbit resources.
- International recognition of these rights by recording frequency assignments and, as appropriate, orbital positions used or intended to be used in the Master International Frequency Register (MIFR).[15]

The first instrument was the Resolution of the United Nations Organisation[16] following the advent of the satellite in the 1950s. The Resolution was followed in 1967 by the Treaty on Principles Governing the Activities of the States in the Exploration and Use of outer Space including the Moon and Other Celestial Bodies.

Neither the Resolution nor the Treaty provided a comprehensive code as may be found for example in the Paris Convention. However, they established some important principles which include that:

- International law applies in outer space.

[15]. MIFR is a record of orbital positions and frequencies kept by the ITU

[16]. United Nations General Assembly (UNGA) Resolution 1962 (XVII), adopted in 1963. It is known as the Declaration of Legal Principles Governing the Activities of States in the Exploration of Outer Space.

- Neither outer space itself nor the moon or other celestial bodies can be appropriated by any state by assertion of sovereignty, occupation or in any other way[17]. The outer space, in contrast with the air space which is under national sovereignty, is free for exploitation and use by all states (*res communis)* on the basis of equality through their governmental or non–governmental entities in conformity with international regulations. Thus no state owns any orbital position and everybody can use this common resource provided that the international regulations and codes are applied.
- States retain jurisdiction and control over objects that they launched in outer space and they are responsible for the space activities carried out by any of their private nationals or firms (even if such states do not exercise any direct or indirect control over such activities). States are thus obliged to establish appropriate supervision and control mechanisms on space networks.

Another relevant international legal instrument is the Declaration of the United Nations on International Cooperation in the Exploration and Use of Outer Space.[18] It called for further international cooperation particularly on the need to assist developing countries and those with incipient space programmes. Those incipient programmes should however stem from such international cooperation conducted with countries with more advanced space capabilities. The Vienna Declaration on Space and Human Development (The Space Millennium) is another relevant universal legal instrument. It was adopted by the third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) in Vienna in 1999.

Procedure for Regulation of the Radio Frequency Spectrum

In empowering the ITU as the regulator of the frequency spectrum, its constitution emphasized the concept of *efficient, rational* and *cost-effective* utilization of the spectrum. In actualization of this concept, the ITU adopts a "first come, first served" procedure.[19] This procedure is based on the principle that the right to use a satellite position is acquired by states through negotiations with the administrations concerned with allocation of frequencies in its region.[20]

When applied correctly, the procedure provides a means of assuring efficient spectrum management and serves a purpose of filling the gaps in the orbit as the need arises. It also leads to a homogenous orbit distribution of space stations in the regions. The regional administrations designate the volume of spectrum resources required to satisfy the actual requirements of the states within the region.

The national administrations of the states within the regions thereafter assign frequencies and orbital positions for the space segments and earth stations of their respective public and private works, while assuming responsibility for the networks. In doing this, the national administrations apply the appropriate procedure of international coordination and recording.

The Mechanism for Sharing the Spectrum Resources

The specific procedures setting out the rights and obligations of the administrations in the domain of spectrum management and achieving radio communication without interference has been laid down by successive World Radio Conferences on the basis of two main principles of

[17] .UNGA Resolutions 1721 (XVII) and 1884 (XVIII).
[18] .UNGA Resolution 51/126, 1996
[19] . Yvon Henri *op.cit*
[20] . See fn. no. 12 *supra*.

efficient use and *equitable access.* The two mechanisms for sharing the orbit and spectrum resources have been developed and implemented through Assignment or Allotment Plans[21] using "A Priori" Planning Procedures and "Coordination" Procedures.
A Priori planning procedures[22] guarantee equitable access to the spectrum resources for **future use** while *coordination procedures*[123] guarantee efficient use of spectrum resources and provision of operation which is free from interference and satisfies **actual requirements.**

Procedures for coordination are consolidated in Article 9 of the Radio Regulations. Radio Regulations[24] also contain provision detailing the requirement for notification of frequency assignments. The basic steps for coordination and notification are:

- *Advance publication*[25], which informs all administrations of any planned satellite system using a geostationary or non-geostationary satellite and its general description.
- *Coordination*[26] which is a formal regulatory obligation both for an administration seeking to assign a frequency to its network and for an administration whose existing or planned services, may be affected by that assignment. An agreement arising from this coordination confers certain rights and imposes certain obligations on the administration concerned.
- Notification/recording[27] which is the final regulation step for recording of the frequency assignments in the Master International Frequency Register (MIFR)

  All members are bound to abide by the Administrative Regulations in all telecommunication offices and stations established or operated by them which are capable of causing harmful interference to the radio services of other countries.[28] These international rights and obligations of administrations are derived from the recording of the frequency assignments in the MIFR or from their conformity, where appropriate, with a plan.

Appraisal of the Legal Regime of the Radio Frequency Spectrum
The legal regime of the radio frequency spectrum is appreciably developed, particularly because all states need a spectrum free from interference. The meteoric increase in

[21]. The Allotment Plans are contained in Appendices 30A and 30B of the Radio Regulations. The plans were established with a view to guaranteeing equitable access to the geosatellite orbits by all countries. The Allotment Plans contain orbital positions, a certain frequency spectrum and a service area, which normally covers only the country's territory. The plan entries are associated with a set of technical parameters in accordance with which a specified satellite network may be implemented. They also contain implementation procedures for those modified requirements, which were not foreseeable at the moment of the establishment of the plans.

[22]. These include:
i. The Allotment Plans for the fixed satellite service using part of the 10-11/12-13GHz frequency bands contained in Appendix 30B of the Regulations.
ii. The plan for the broadcasting –satellite service in the frequency band 11.7-12.7GHz (Appendix30) and the associated Plan for feeder links in the 14GHz frequency bands (Appendix 30A).

[23] These include:
i. Geostationary –satellite networks (in all services and frequency bands) and non-geostationary satellite networks in certain frequency bands which are subject to advance publication and coordination procedures.
ii. Other non-geostationary satellite networks (all pertinent services and certain frequency bands), for which only advance publication procedures is required before notification.

[24]. Article 11 and Resolution 33
[25]. *ibid*. Art.9(i)
[26] . *ibid* Art.9(ii)
[27]. *ibid*. Art. 11
[28]. Art. 6, Constitution of ITU.

technological development has brought private individuals, the military, national and multinational corporations and international institutions as participants in the scramble for the finite spectrum resource.[29]

The international community has made tremendous efforts and the states commensurably collaborated, towards achieving efficient and equitable access to, and use of the spectrum. However due to the progressive exploitation of the frequency resources and the consequent congestion of the geostationary satellite orbit, member countries of the ITU have had cause to consider more critically the question of equitable access to the spectrum resources. This led to the establishment and introduction into the ITU regulatory regime of the spectrum resources, plans in which a certain amount of frequency spectrum is set aside for future use by all countries, particularly those who do not possess a current capability to use the resources. This module of plan, in which each country has a predetermined orbital position, provides a guaranteed equitable access to the spectrum resources to each country.

> It does not appear gainful however to set aside a band of frequencies indefinitely for a predicted future need if other application or usage of bands has proved effective. Moreover, commitments made, and expenses incurred towards a potential usage of the warehouse spectrum (e.g. capital investment) may make it difficult to transfer the spectrum to other use. It would thus be less costly in the long run to let the resource lie fallow temporarily.

With the dramatic development in telecommunication services, there has been an increase in the demand for the usage of the spectrum. This increase has been attributed to many factors. These include:[30]

- technological progress,
- political, social and structural changes around the world with the consequent impact on the liberalization of telecommunication services,
- the introduction of non-geostationary satellite orbit systems for commercial communications,
- growing market orientation,
- the change in the way the widening market is shared between private and public service providers and
- the general globalization and commercialization of communication systems.

These factors prompted the ITU plenipotentiary Conference (Kyoto, 1994)[31] to call for a review of the ITU procedures for the allocation of the spectrum resources. As a result of the call for review, the World Radio Conferences of 1995 and 1997 reviewed and revised the legal regime applicable to all space applications and services. This led to new concepts such as "administrative due diligence", which applies to some satellite communication services,

[29]. Membership of the ITU is open to states only. It has been argued that international telecommunications organisation with their global responsibilities should be, at least, associate members of the ITU. They are significantly more important than many of the small member states of the Union who do not have sufficiently trained experts. Interest of those organisations, who invest heavily in the industry, may thus not be properly represented. See Francis Lyall, **"Communication Regulation: The Role of the International Telecommunication Union"**, JILT. 1997, vol.3

[30] Yvon Henri, *op. cit.* p. 25

[31] Resolution 18

reduction of the regulatory time limit for bringing a satellite network into use and simplification of the information to be provided to initiate the registration process for a satellite network.

In 2002[32] further improvements were made towards improving the satellite network notification process[33], implementation of cost recovery of satellite network filings,[34] elimination of the backlog in processing of satellite filing and dead line for submission of notification.[35]

In 2003, the World Radio Conference (WRC) introduced more changes with regards to improved access to data and mandatory deadline for submission of notification. It also agreed to consider possible changes to the satellite network registration procedure in the WRC of 2007.

Problems Associated with the Regulatory Framework of the Radio Frequency Spectrum under International Law

In spite of the developments and landmark innovations, there are still prevailing problems in collaboration, allocation and regulation of the radio frequency spectrum. The problems (not in order of gravity) are as follows:

a. The difficulty in states agreeing to a unified global communication system, probably due to the importance of secrecy in relation to information on security and military functions of governments, is a problem related to collaboration in the use of the spectrum. Consequently, states are only willing to assign limited roles to the ITU. Thus, its functions have been limited to facilitating connections among systems and preventing these systems from interfering with one another.
b. Another problem in relation to allocation of radio frequencies is the one associated with dangers inherent in direct broadcasting through satellites to consenting and non-consenting states alike. States are entitled to freedom of information, which includes freedom to obtain them from any source.

This freedom is enshrined in international legal instruments.[36]

The principle of freedom of information conflicts with the principle of state sovereignty. The latter gives autonomy and control to states over their respective territories which ordinarily include right and control by states over information that is obtained within their boundaries. Attempts were made to reconcile this conflict of legal principles by the United Nations Education and Scientific Commission (UNESCO) in 1972 and the General Assembly of the United Nations in 1986.

In 1972[37], the UNESCO provided that a state had the right to decide on the content of educational programmes broadcast to their own peoples. It further declared[38] that prior

[32] Resolution 86 (Rev. Marrakesh, 2002)
[33] Council Decision 483
[34] Council Decision 482
[35] Resolution 1182
[36] International Covenant on Civil and Political Rights, 1966; Art. 19, Universal Declaration of Human Rights, 1948; Art. 10 and regional conventions e.g. the European Convention on Human Rights, 1950, and the African Charter on Human and Peoples Rights.
[37] See The Declaration of Guiding Principles on the Use of Satellite Broadcasting.
[38] Art. IX.

agreement was required for direct satellite broadcasting to the population of countries other than the country of origin of transmission.

In 1986, the United Nations General Assembly (UNGA) adopted a Resolution[39] which provided that a state intending to establish or authorize the establishment of a direct television broadcasting satellite service must first notify the proposed receiving state or states and then consult with them. A service may only be established after this and on the basis of the agreements reached and in conformity with the relevant instruments of the ITU. These two attempts appear to be feeble. The 1972 Declaration of UNESCO was clearly meant to regulate transmission of materials with educational content. Materials, which may be offensive to a state (e.g. materials deemed offensive by a state with a state religion) or materials that may impugn or be detrimental to the security of a state were outside the focus of the Declaration and has not yet been addressed.[40]

The 1986 Resolution was also futile because the developed states of France, West Germany, U.S.A. and Japan voted against it.

c. Remote sensing is another phenomenon of the frequency spectrum that poses a problem in the area of regulatory framework of the radio frequency spectrum. Remote sensing refers to:

> The detection and analysis of the earth's resources by sensors, carried in aircraft and spacecraft and covers, for example, meteorological sensing, ocean observation, military surveillance and land observation.[41]

It is a technique, which can improve man's knowledge of the earth and can also be used to discover and analyse mineral resources, soil quality, the ecosystem, grain production, offshore pollution, etc. It is therefore useful in geography, geology, agriculture, forestry, oceanography, water conservancy and environmental science.

The potential of remote sensing is tremendous but the use to which data obtained from sensing activity is put is very controversial.[42] The activity can raise some legal issues ranging from whether the sensing violates the sovereignty of the air space of the sensed state, to whether the consent of the sensed state is required. In 1986 the General Assembly of the United Nations adopted several principles[43] in attempt to resolve the controversies some of which are to the effect that:

- Remote sensing should be carried out for the benefit and interest of all states with particular attention to the needs of developing countries.
- The activity should promote international cooperation and environmental protection of the earth.

[39] Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting: UNGA Resolution 37/92.

[40]. The recent face-off between the state of Nigeria and the management of the Cable News Network (C.N.N.) over the direct T.V. broadcast by the latter of pictures of the operations of militants in Niger Delta Region of Nigeria was based on the feeling of Nigeria that the information was too sensitive to be put in the public domain.

[41]. Malcom N. Shaw **"International Law"** 5th edition, Cambridge University Press, 2003, p487-488

[42]. Christol, **"Modern International Law"** 21(4) UN Chronicle, 1984, p.32

[43]. UNGA Resolution 41/65

- The sensed state shall have access to the primary and processed data upon nondiscrimination basis and at reasonable cost.
- The sensing states shall bear international responsibility for their activities.

A major lacuna in these principles was the absence of the requirement of consent of the sensed state. There have been views that the omission was to give effect to the provisions of the 1967 Treaty on Outer Space[44] which provides for freedom of exploration and use of the outer space. This justification does not cure the negative effect of that omission considering the fact that the data obtained by sensing are natural resources over which states have permanent sovereignty.[45] Moreover the activity of sensing, though it originates from outer space is directly on resources, not within the outer space, but within the territory of a state.

Conclusion

There has been a controversy over the efficacy of the system of allocation of the Radio Frequency Spectrum. The economists and engineers from the developed states argue that the present system of allocation of the frequency is too rigid and inefficient. They also feel that it is wasteful and ill adapted to a field where technological progress is extremely rapid. Their argument is hinged on the premise that the present system inhibits investment in radio communications because some portions are subjected to pressure while others are underutilized. They advocate for greater flexibility so that investors can invest knowing that they can make alterations and re-invest in another location if the earlier investment turns out not to be lucrative.

The developing states on the other hand are critical of the present system of allocation to the radio frequency spectrum but for a different reason. They contend that the system is too favourable to the developed states that have the technical resources to foresee and express their needs. Since the spectrum is a limited resource and allocation made for one purpose precludes another, they argue that their needs are more often slighted.

Due to the progressive exploitation of the orbit/frequency resources the anxiety and concerns of all members increased, particularly due to the likelihood of congestion and exhaustion of the geostationary-satellite orbit. This prompted the ITU member countries to consider more seriously, the question of equitable access to the spectrum resources. This led to the establishment of, and introduction into the regulatory regime of the ITU, the frequency/orbital position plans in which a certain amount of spectrum is set aside for future use by all countries particularly those which are not capable of making current use of the resources.[46] These frequency/orbital position plans in which each country has a predetermined orbital position ensures availability to them a certain amount of frequency spectrum together with associated procedures, at any time.[47] Such plans govern the usage of the spectrum for telecommunication services.

During the last 40 years, the regulatory framework has been constantly adapted to changing circumstances and has achieved the necessary flexibility in satisfying the two major, but not

[44]. Shaw, *op.cit.* p.488
[45]. UNGA Resolution 2692 (XXV) and Resolution 3281 (XXIX)
[46]. See fn. 22 to 24
[47]. Nigeria gained access to the geostationary satellite orbit through the launching of the NIGCOMSAT 1. it would not have been possible without such regulation in existence since the developed states would have exhausted every available orbit

always compatible requirements of efficiency and equity. Since the World Radio Conference (WRC) of 2003, the provision of additional staff and software packages to the administrations has resulted in removal of backlog of advance publication of information and coordination request for non-planned satellite network services. The WRC of 2007 was held in Geneva from 22nd October to the 16th of November 2007. Africa held its regional preparatory meeting for the conference under the chairmanship of Ernest Ndukwe, the chief executive officer of Nigerian Communication Commission in August 2007. The states of the African region identified key priority areas on which common positions were to be established. The meeting also reviewed common positions and proposals of the region based on the agenda items of the conference.

The W.R.C. of 2007 took decisions on issues concerning terrestrial and space radio applications, aeronautical telecommand systems, satellite services, mobile maritime distress and signals, broadcasting for meteorology and the prediction and detection of disasters. The conference also tackled the problems associated with other procedures of notification and recording in the MIFR for non-planned services and regulatory processing deadlines. The next W.R.C. is scheduled to take place in 2011. The measures outlined in the resolutions of WRC. 2007 should be made operative if the ITU would still maintain its credibility and relevance to the satellite community.