DO THE PRINCIPLES OF THE ITU REALIZE THE OUTER SPACE TREATY'S CONCEPT OF EQUITY?

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INTRODUCTION

The use of the Geostationary Stationary Orbit (GSO) and associated frequency spectrum is a prime example of the tension existing in the *de jure* expressions of exploration and the use of outer space and the *de facto* enjoyment of space benefits.[1] The GSO is a natural resource that, in terms of the Outer Space Treaty[2] (OST), is meant to be available to all states equally regardless of their economic or scientific progress. If state practice is anything to go by, however, it is this very economic and scientific progress that has been the major stumbling block for the developing countries to access the GSO. On the other hand, this same progress has seen a number of leading developed states using the GSO and benefiting extensively from this resource.

Regulating the GSO and associated frequency spectrum is a role exclusive to the International Telecommunication Union (ITU). Owing to the manner that it conducts the regulations; the ITU has achieved the status of a specialised agency of the United Nations (UN). In the early days of regulating the orbit, there were not many players in outer space, and assignments were relatively simple and straight forward under the "first come, first served system". Developments in the past 30 years have, however, seen a completely different playing field taking shape. More and more countries are involved in space activities and many more countries have satellites in orbit. Regulation of the GSO has become even more technical and complex. This means that even more sophisticated and creative methods are required for the ITU to succeed at regulating the GSO.

The most controversial and understandably the most taxing measure expected from the ITU is the ability to regulate the GSO and associated frequency equitably among member states. The developing countries and equatorial countries were among the first to challenge the ITU's regulation of the GSO against the standards of equity as set by the OST and the 1996 Space Benefit Declaration[3]. On realising that the orbit could be saturated by the space-faring nations (mostly developed states) before the non-space- faring nations had amassed enough resources and scientific knowledge to access the GSO, a number of equatorial countries claimed their rights to the GSO in 1976 through what is famously known as the Bogota Declaration. The Declaration

raised very important principles, such as sovereignty, non-appropriation, delimitation of space, and the sharing of benefits.

Although the Declaration was rejected totally by most states as being contrary to the values of the OST, it was the equity and fairness principles raised in the Declaration that caught the attention of the world. The same principles have kept the equatorial countries going with their claims for as long as anyone was willing to listen.

The equity and fairness principles are found in a number of international instruments, including the OST, and United Nations (UN) resolutions and declarations. One can assume only that what the equatorial countries sought to achieve was simply to claim what had already been secured for them by the above instruments albeit based on unsustainable legal arguments. The main difficulty, however, has been in defining fair and equitable access particularly in light of the controversial common interest principles. What follows below is an attempt to illuminate how these principles were infused in the current Constitution of the ITU, the Convention, and Radio Regulations and how this infusion measures against the standards as provided in Article 1 paragraph 1 of the OST and the 1996 Space Benefit Declaration.

In a purposeful effort to ensure access to the GSO for all states, the ITU made changes to its Convention (article 33) and, subsequently, to its Constitution under article 44. This provision, which it has been argued has now developed an international status, generally ensures equitable access to the orbit by all states taking into account the geographical position of the equatorial states and, more importantly, particular account of the special interests of the developing countries.

This provision is a major development in ensuring equitable access to the GSO by all states. Indeed the ITU's intergovernmental process for the formulation and updating of a detailed regulatory regime serves as an example of how equitable access can be achieved. More, however, needs to be done to achieve substantive fair and equitable access to the GSO and the equitable sharing of its benefits.

It is no secret that the GSO is close to saturation. Hence the ITU will have to be more creative in ensuring access to the orbit by devising new regulatory systems for

achieving this. Being more stringent with regulation of paper satellites, reducing the duration it takes between reserving a slot and actually using it, providing a mechanism for sharing of slots, redirecting traffic from the C bands slots, and encouraging the use of other band slots, such as the Ka band slots, are some of the innovative ways possible. The paper finally considers that instead of looking for new mechanisms or new organizations for managing the GSO, increasing the efficiency of the current mechanisms might actually prove the best way forward.

CHAPTER 1

(1) The GSO

The GSO is a circular orbit at a distance of about 36 000 km (22,300 miles) above the earth's equator.[4] A satellite placed in this orbit turns within the same period as the Earth itself and thus remains stationary in relation to the underlying point on earth.[5] As seen from a point on the earth's surface, the satellite always occupies the same fixed position in the sky.[6] It was the famous British science fiction author, Arthur C. Clarke, who, in an article published in "Wireless World" in October 1945, suggested for the first time the potential advantages of the GSO for global communication purposes.[7]

The GSO is governed by an international allotment regime created through the ITU. The main advantages derived from this natural resource are: Telecommunications, Meteorology, and Space Research.[8]

Telecommunication - The first and most effective use of the GSO is for satellite communication. This is because the orbit provides the most efficient, inexpensive, effective, extensive, and reliable communication links.[9]

There are, generally, three categories of communication systems using satellites in the GSO: the fixed satellite service; the mobile satellite service; and the direct broadcasting satellite service.

Fixed satellite communication not only provides traditional telecommunication services, such as telegraph, telephone, facsimile, and television, but they further provide services like high speed data transmissions, telemedicine, tele-conferencing, computer linkage, international real time television, etc.[10] The telecommunication satellites enable a variety of communications - voice, video, pictures, and data - to be transmitted simultaneously.[11]

According to Reijnen and de Graaff,[12] with fixed satellite services, the transmitting ground stations and the receiving stations are at a fixed position on the ground. The

equipment of the ground stations is very sophisticated while the satellite components can be relatively simple. For a mobile satellite service, however, the earth stations are located on moving vehicles such as cars, ships, aircraft, and other satellites. Since most of the mobile equipment is less complex than for ground stations, it is the satellite which has to be more complex and powerful. The same is true for broadcasting satellite services because they transmit radio and television programmes to not only large receiving stations but, in particular, to large numbers of small receiving stations and even to individual home receivers.

The geostationary satellites have also proved useful for various other innovations, including detection and control functions for the public service sector, such as electronic mail, personal, and police communication.

Above all, long distance communication links via satellite are cheaper because: a) the cost of these links is generally dependent on the distance between the two interconnecting points; and b) the cost of telephone circuits is also less because of the flexibility of satellites for connecting any points within the service area, and with any pattern or traffic volume.[13]

Meteorology – Because of its relatively immobile position in relation to the earth's surface, a satellite on the GSO can provide enormous coverage of the same portion of the globe. Continuous survey of large portions of the globe is particularly significant for the detection and tracking of severe storms which are small in size and transient in nature. Meteorologists use these satellites for disaster management and constant weather monitoring.

The GSO further allows the satellite to make frequent observations of the earth's atmosphere unlike lower altitude satellites which provide coverage only once every 12 hours. Geostationary meteorological satellites are also capable of collecting information from a large number (up to 10 000) of fixed and moving data collection platforms (DCPs) of various types (meteorological, oceanographic, hydrological etc.) and of relaying these data to central ground stations for further processing and dissemination[14].

Space Research - Since the GSO satellite provides 24 hour continuous contact with the earth station, it is advantageous for space research purposes.[15]

(2) The radiofrequency spectrum

Satellites operate through radio signals and, thus, use the radio frequency spectrum to provide their services.[16] The radio frequency spectrum is a specific band of the electromagnetic spectrum that allows satellites to communicate with the Earth.

Because of the fact that both terrestrial and satellite-based types of radio services require the radio frequency spectrum to operate, the need for managing and properly allocating such resources emerges. In order to coordinate the working of various radio systems, the ITU categorises radio services according to their broader functions. Frequency allocations are then made for each service indicating which service can use a particular part of the spectrum and which status it has.

(3) The challenges - *Problem of access*

What is clear is that the use of the GSO by telecommunication, meteorological, and space research satellites has increased over the years, and the demand for geostationary orbital slots continues to rise. The problem is that the GSO, while not depletable like other natural resources, faces a number of challenges stemming from technological and natural limitations.

The technological limitations include congestion and saturation of the GSO which may result in possible physical collision between satellites as well as radio interference.

The natural limitation is that it lies at approximately only 36,000 km above the equator and nowhere else and in a three dimensional ring. Only a limited portion of the orbit is of use to a country since the satellite must be in a position to ‘see’ the area which it is required to ‘serve’. Only certain portions of the orbit can, therefore, be used by a particular country.

The geographical position of the countries is not the only limit to this natural resource. A handful of techno-economically developed countries have occupied the most suitable and useful positions to the detriment of a large majority of late-comers.

Owing to their economic and technological capabilities, most positions have been taken up by the developed countries and by multi-administration organizations such as International Telecommunications Satellite Organisation (INTELSAT), the International System and Organisation of Space Communication (Intersputnik), and the International Mobile Satellite Organisation (formerly Inmarsat, now IMSO), and only a few by the developing countries.

Economic and technological difficulties are a stumbling block for developing countries to establish their own satellite systems. Most of these countries, especially those on the African continent, are reduced to being junior partners in the space enterprise, if, indeed, not envious spectators who yearn for the day that they are able to possess the technological capability to access space on their own.[17]

(4) The Freedom of Use and Non-Appropriation Principles

The fears underlying the orbiting of man-made satellites led to an insistence on the peaceful uses of outer space. The potential for military strategic advantages of space technology was to be kept in check while not compromising the ability to undertake reconnaissance on adversaries. Outer space and celestial bodies are free for exploration and use by all and "are not subject to national appropriation, by claim of sovereignty, by means of use or occupation, or by any other means".[18]

In essence, international space law provides protection for any space-faring country or entity to use, freely and without interference by another, of any part of outer space, including the Moon and other celestial bodies. Yet the mere fact of use or occupation does not entail a claim of ownership; that part of outer space is still free for others to explore and use while giving due regard to the corresponding rights of other users.[19] The GSO and associated frequency spectrum are regarded as an integral part of outer space and, thus, subject to the fore-going principles.

These principles of international space law enshrined in space treaties are considered to be part of international customary law and, as such, binding on all nations, whether State Parties to the space treaties or not.[20]

SUMMARY

The GSO is a natural resource a few miles above the earth's orbit. Through the placing of satellites on this orbit, earth has benefited extensively in terms of telecommunications, meteorology and space science. This natural resource is governed by an allotment system provided by the ITU. Although not depletable, a country's economical and technological competence and its geographical position could limit its access to this resource. This is particularly relevant with regards to developing countries. The quantity of satellites that can be placed in orbit is another aspect that can cause limitations to the GSO due to issues of congestion and saturation. These technological limitations are directly linked to the limited prime positions in the GSO. Suffice it to say most of these positions are occupied by the developed countries because of their economic and technological competency. Nevertheless, the GSO and associated frequency spectrum are regarded as an integral part of outer space and, thus, subject to the freedom of use and non-appropriation principles found in the OST.

CHAPTER 2

(1) The Call for *Sui Generis* Rules for Near Equatorial Orbits - *The Bogota Declaration*

In a bid to protect their rights to the GSO, a number of equatorial countries signed the so-called Bogota Declaration on 3 December 1976. The Declaration caused an international controversy with respect to access to, and use of, this natural resource of outer space. Although the assertions raised by the equatorial States were strenuously opposed by other States, the Declaration raised serious questions as to the existing practice of utilization of the orbit and, for the first time, posed a challenge to the viability of the international legal order on outer space.[21]

(2) Analysis of the principles of the Declaration

On 3 December 1976, a number of States traversed by the Equator signed the Bogota Declaration in Colombia[22]. The Declaration was signed by the Heads of Delegations of Brazil, Colombia, Congo, Ecuador, Indonesia, Kenya, Uganda, and Zaire.

The Declaration asserts that segments of the GSO lying above their territories are an integral part of the territory over which the equatorial countries exercise complete and exclusive sovereignty.

The above assertion was based on the following arguments:

> *Equatorial countries declare that the geostationary synchronous orbit is a physical fact linked to the reality of our planet because its existence depends exclusively on its relation to gravitational phenomena generated by the earth, and that is why it must not be considered part of the outer space. Therefore, the segments of geostationary synchronous orbit are part of the territory over which Equatorial states exercise their national sovereignty;*

The solutions proposed by the International Telecommunications Union and the relevant documents that attempt to achieve a better use of the geostationary orbit that shall prevent its imminent saturation are at present impracticable and unfair and would considerably increase the exploitation costs of this resource especially for developing countries that do not have equal technological and financial resources as compared to industrialized countries, who enjoy an apparent monopoly in the exploitation and use of its geostationary synchronous orbit;

The geostationary orbit and the frequencies have been used in a way that does not allow the equitable access of the developing countries that do not have the technical and financial means possessed by developed countries;

Under the current rules of the International Telecommunication Union, the GSO is a limited natural resource over which the equatorial countries exercise permanent sovereignty in line with UN resolutions;

There is no satisfactory definition of outer space to support the argument that the GSO is included in outer space; that "the legal affairs sub-commission which is dependent on the United Nations Commission on the Use of Outer Space for Peaceful Purposes, has been working for a long time on a definition of outer space, however, to date, there has been no agreement in this respect", there is a need to define the legal status of the geostationary orbit. The lack of definition of outer space in the Treaty of 1967,… "implies that Article II should not apply to geostationary orbit and therefore does not affect the right of the equatorial states that have already ratified the Treaty"; and

The OST cannot be a final answer.

Having regard to the above claimed rights, the equatorial countries proposed that the applicable legal consultations in this area must take into account the following:

The sovereign rights put forward by the equatorial countries are directed towards rendering tangible benefits to their respective people and for the

universal community, which is completely different from the present reality when the orbit is used to the greater benefit of the most developed countries.

The segments of the orbit corresponding to the open sea are beyond the national jurisdiction of states and will be considered as common heritage of mankind. Consequently, the competent international agencies should regulate the use and exploitation for the benefit of mankind.

The equatorial states do not object to the free orbital transit of satellites approved and authorized by the International Telecommunications Convention when these satellites pass through their outer space in their gravitational flight outside their GSO.

The devices to be placed permanently on the segment of a GSO of an equatorial state shall require previous and expressed authorization on the part of the concerned state, and the operation of the device should conform to the national law of that territorial country over which they are placed. It must be understood that the said authorization is different from the co-ordination requested in cases of interference among satellite systems, which are specified in the regulations for radio communications. The said authorization refers, in very clear terms, to the countries' right to allow the operation of fixed radio communications stations within their territory.

Equatorial states do not condone the existing satellites or the position they occupy on their segments of the GSO nor does the existence of said satellites confer any rights of placement of satellites or use of the segment unless expressly authorized by the state exercising sovereignty over this segment.

The Bogota Declaration was rejected in all international space forums as being inconsistent with the principles of the outer space legal regime and freedoms articulated in the OST. Yet the propositions still persist today.[23] From the above Declaration a few concepts arise for discussion. These are as follows:

(a) Delimitation of space

The equatorial countries argued that it was imperative to elaborate a juridical definition of outer space, without which the implementation of the Treaty of 1967 was no more than a way to give recognition to the presence of the states that were already using the GSO. They added that, under the name of a so-called non-national appropriation, what was actually developed was the technological partition of the orbit, which was simply a national appropriation.

It is true that, although the UNCOPOUS has been dealing with the delimitation problem for quite some time now, there is still no present universal agreement as to the meaning or the delimitation of space, not even with respect to the basic question of whether a delimitation of outer space is necessary or not.[24] The problem is mainly associated with the unpredictable political and economic implications of the problems as well as their scientific and technical nature.[25]

(b) Sovereignty

The equatorial states had to declare the GSO a national natural resource in order to invoke international law on the sovereign rights over natural resources. The Bogota Declaration thus reaffirmed "the right of the peoples and of nations to permanent sovereignty over their wealth and natural resources that must be exercised in the interest of their national development and of the welfare of the people of the nation concerned."[26] The Declaration, furthermore, affirmed that, "All states have and freely exercise full and permanent sovereignty, including possession, use and disposal of all their wealth, natural resources and economic activities".[27]

The above-mentioned provisions led the equatorial states to affirm that the GSO, being a “national” natural resource, is under the sovereignty of the equatorial states.

This argument refers back to the difference between the legal status of airspace and outer space, in that, while every state has complete and exclusive sovereignty over the airspace above its territory according to general international law, national law cannot be extended to outer space.[28] This extension is strictly excluded by article 1 of the OST. The equatorial countries’ claim of exclusive sovereignty over the GSO

above their territories could probably have been prevented if the delimitation question had been settled earlier.[29]

(c) Non-appropriation

Article II of the OST is fundamental to the regulation of outer space, its exploration, and its use for peaceful purposes. The object and purpose of Article II is found in the Preamble of the Treaty and reinforced by its provisions as shown above. Article II provides for three instances where the outer space cannot be appropriated:

National appropriation - It is suggested by most scholarly writers that the OST prohibits both public and private appropriations.[30] This view is further supported by Article 11 of the MOON Agreement[31].

Claim of use or occupation - It is accepted that the use and exploitation of the outer space is allowed by both the State and its private entities. No amount of use, however, can ever justify a claim of ownership rights over the whole or part of the outer space including the moon and celestial bodies. This concept of "use" stems from Article I to the effect that all States shall be free to use and exploit the outer space without discrimination and on the basis of equality in accordance with international law.

Similarly, no amount of occupation of the outer space will constitute an appropriation.[32] Traditional international law modes of ownership rights, such as continuous and peaceful effective control over a territory or a display of such under the international law principle of "prescription", do not apply to the *res communes'* nature of outer space.

Any other means - The purposeful and intentional assertion of this expression at the end of Article II simply blocks all other efforts to acquire ownership rights over (a part of) outer space.[33] Simply put, no activities of States or non-state entities or natural persons will ever give rise to a legitimate claim to ownership rights.[34]

(3) Equity and Fairness Principles

If one considers the Preamble to the 1974 UN General Assembly Declaration on the Establishment of a New International Economic Order (NIEO), the essence of equity is captured in the enumeration of the principles on which this NIEO should be based. The Preamble states that the NIEO is an economic order,

> *"which shall correct inequalities and redress existing injustices, make it possible to eliminate the widening gap between the developed and the developing countries and ensure steadily accelerating economic and social development in peace and justice for present and future generations"* (UN Resolution 3201, 1974).

The NIEO elucidates a number of notable aspects for achieving substantive equality. Firstly, according to the Declaration, the benefits of technical progress are not shared equitably by all members of the international community. 70 per cent of the world population is made up of developing countries yet the same countries account for only 30 of the world income. It is against this background that cooperation between the states to achieve a new economic order must be centered round the principles of equity.

In the Preamble of the Charter of Economic Rights and Duties of States (UN Resolution 3281, 1974) it is emphasized that the new international economic order to be established must be based on the principle of equity. For our purposes. Article 29 is of special importance. It provides that,

> *"The sea-bed and ocean floor and the subsoil thereof, beyond the limits of national jurisdiction, as well as the resources of the area, are the common heritage of mankind. On the basis of the principles adopted by the General Assembly in resolution 2749 (XXV) of 17 December 1970, all States shall ensure that the exploration of the area and exploitation of its resources are carried out exclusively for peaceful purposes and that the benefits derived there from are shared equitably by all States, taking into account the particular interests and needs of developing countries; an international regime applying to the area and its resources and including appropriate*

international machinery to give effect to its provisions shall be established by an international treaty of a universal character, generally agreed upon."

The common heritage principle mentioned above has been adopted in the OST, the Convention on the Law of the Sea[35] (LOSC), and in the Moon Agreement. The definition and meaning of the concept of common heritage of humankind has been the subject of discussion for ages. Chapter 4 below considers how the principles of equity are addressed in the common interest principles.

SUMMARY

The above discussion was intended to shed some light on the important principles raised by the Bogota Declaration and why the arguments were untenable legally. Despite its lack of success, however, the Declaration was a political move that raised serious questions as to the then existing practice of the utilization of the orbit and, for the first time, posed a challenge to the viability of the international legal order on outer space.[36] It can be assumed that one of the reasons for the presentation of the above claims by the Equatorial States was a desire to create a set of rules directed towards not only formal but also substantive equitable sharing of the benefits of the GSO as formally guaranteed to them in the following UN Declarations, Charters, and treaties.

CHAPTER 3

(1) Common Interest Principle

The concept of equitable sharing of benefits is found in a number of international instruments, declarations, and charters of the UN. Our starting point is the common interest principle found in the OST.

The OST makes reference to outer space being a province of mankind. The principle was expressly recognised in 1958 by the UN General assembly in its first resolution[37] specifically concerned with outer space where emphasis was laid on "the common interest of mankind", "common aim that outer space should be used for peaceful purposes only", "benefit of mankind", "strengthening of friendly relations among people", "international cooperation", etc.[38]

According to Jakhu,[39] the General Assembly was also conscious that uncontrolled freedom (particularly since all countries are not equally developed economically and scientifically) could lead to the monopolisation of outer space by a few countries, which was contrary to its desire "to promote energetically the fullest exploration and exploitation of outer space for the benefit of mankind". In that regard the Committee on Peaceful Uses of Outer Space (COPUOS) was called upon to report on any international cooperative programmes that could be undertaken for "the benefit of states irrespective of their economic or scientific development". This overarching provision which implies the acceptance and recognition of the special interests and needs of the non-space powers was advocated for by the developing countries.[40]

Article 1 paragraph 1 of the OST provides that:

> *"The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind."*

According to Jakhu,[41] the term "province of all mankind", used in article 1 paragraph 1 of the OST, reinforces the common interest principle. It implies also that outer space is within the domain and under the jurisdiction of all mankind as opposed to an individual or a group of states.

As appears above, the freedom concepts are subject to the limitation clause which confirms that the exploration and use of outer space ought to be carried out for the "benefit of and in the interest" of mankind.

In terms of Article 1 paragraph 1, the exploration and use shall be done for the benefit and in the interest of all countries. This clarifies that the respective benefit of the activity in outer space shall be not only for those countries that have made an investment or have undertaken the activity, but shall be done in the interest of all countries[42].

According to Stephan Hobe[43], this provision ensures that the non-space-faring members of the international community shall participate in the exploration and use of the outer space and the benefits derived from these activities without being themselves capable of actively participating in the exploration of outer space on a national level. However, Hobe is doubtful whether this amounts to an obligation of the sharing of benefits of a respective later space activity. He concedes, though, that the provision may amount to an "enabling" clause in the sense that space-faring countries should enable the non-space-faring members of the international community to participate more actively in space exploration and use.

Stephan Gorove analysed the limitation clause as follows[44]:

> *"What is or is not to the benefit and in the interests of all countries may not always lend itself to an easy determination. Something which is thought to be of benefit to a country on the basis of available information and criteria today may be regarded on the basis of new information and criteria detrimental tomorrow. Also who is going to determine whether or not a particular exploration and use is in a given case for the benefit of all nations? Since there is no provision in the Treaty for the settlement of disputes it is likely that each state – short of an amicable disposition of the issue – would*

> *insist on its own interpretation… whether or not only the "exploration and use" must be beneficial to all countries or also the "results," that is, the benefits derived from such exploration and use, is a further very important question… Assuming then for a moment that the "results," of exploration and use were meant, the question arises whether or not "all" such results or benefits were intended and, if so, must all such results be "shared" in order to constitute a benefit to all countries?... Thus it would appear that appropriate international agreements would have to be concluded before equal enjoyment of benefits could be regarded as more than a broad statement of general policy."*

It is of interest that the so-called common interest provision is not regarded by most writers as requiring states to share the benefits in any specific manner but rather as expressing a desire that the activities be beneficial in a general sense[45]. For instance, space activities pertaining to telecommunications, broadcasting, meteorology, and solar power transmission may be regarded as generally beneficial to all countries, and that engagement in any of these activities would appear to satisfy the requirement of the common interests' clause. According to Gorove, the "benefit and interests" of the country conducting the exploration and use must also be taken into account; otherwise the exploration and use would not benefit "all" countries.

Gorove concludes from the above submissions that Article 1 paragraph 1 is not self-executing but rather a kind of imperfect piece of legislation, expressing an aspiration, couched in very general terms, which could not be specifically implemented without further elaborations and guidelines, particularly those relating to the determination of the degree and nature of the sharing and the kinds of benefits that are to accrue.[46]

The lingering and persistent yearning to ensure the benefits derived from the use of outer space are widely enjoyed has led to numerous legal efforts to define a responsive outer space legal regime. In that regard, a number of resolutions on the need for international cooperation have been passed by the UN General Assembly. The 1996 Space Benefit Declaration provides for international cooperation that is to be carried out in the exploration and use of outer space to be "for the benefit and in

the interest of all States, irrespective of their degree of economic, social or scientific and technological development" and "particular account should be taken of the needs of developing countries".

However, it was not until the negotiations of the LOSC were underway that the term "common heritage of mankind" was used. Later, it was included in Article 1, paragraph 1 of the Moon Agreement, which reads, "The moon and its natural resources are the common heritage of mankind which finds expression in the provisions of this Agreement, in particular in paragraph 11 of this article." Art 139 of the LOSC, in addition, states that, "The area and its resources are the common heritage of mankind."

It suffices to state that the common interests' principle concretises the solidarity approach among states.[47] That is to say that areas which are outside the national jurisdiction, like the High Seas, the Deep Sea Bed, and also the Outer Space and Celestial Bodies, should not be subject to national claims of sovereignty and should be exploited in a way which should take account of the specific needs of the developing world.[48]

Simply put, the provisions provide that humanity must move on as one, or it will not be able to move.[49] Not only do the provisions illustrate that equity must be the point of departure whereby the prevailing disparities in the world may be banished and prosperity secured for all, but also they recognize the practical requirements of profound change.

(2) How cooperation can be achieved in the light of the common interests principles

Admittedly, there has been a growing realization among countries - both developed and developing – that international cooperation will be vital for all countries to maximise their investments in space activities[50]. In recent years there has been a sharp increase in cooperation among countries already active in space as well as a corresponding increase in cooperation between developed and developing

countries[51]. It is, therefore, important for the international community to build on the achievements of recent years and to take steps to further strengthen the mechanisms for international cooperation in space activities in order that all countries will be able to take advantage of these exciting technologies for their developmental needs[52].

The common interest principle clearly provides a starting point in developing principles designed to augment the provisions of article 1 of the OST calling for international cooperation in achieving equitable access to the GSO and sharing of benefits derived from them. For a start, an analysis of how this cooperation can be achieved better using the example of the mankind provisions shows that the approach to the mankind provisions is crucial to their application and substance. For instance, under the LOSC a more rigid and restrictive approach to the common heritage conception prevailed, spearheaded by Art 140 of LOSC. In the Moon Treaty, however, Art 11 provides a less rigid approach to the common heritage concept.

Owing to the rigidity of some of the mankind provisions, most developed nations have generally adopted the view that they stand as an obstacle to the advancement of the interests of the developed nations whether in space or in the sea, and should be, if not abandoned, justifiably ignored. This is so, according to this view, because of the fear that treaty provisions exclude private commercial enterprise and can force the distribution of space/sea resources among all nations with little regard to the investment made by the nation or organization that actually obtained them.

According to Gabrynowicz,[53] the tragedy is that evading the mankind provisions because of this definition supports and gives credence to the very ideology that the position is intended to resist. Furthermore, that disavowal of the mankind provisions on the grounds that they are anti-commercial and anti-free enterprise is a tacit acceptance that they are anti-commercial and anti-free enterprise.

It is this conflict and general lack of clarity in the provisions that has led some leading maritime and developed states to abstain from ratifying the LOSC and the Moon

Treaty. In 1990, the UN General-Secretary, Perez de Cuellar, started informal consultations on some points of the LOSC including, among others, the question of the transfer of technology, the structure of the International Sea-Bed Authority, and the provisions obliging states to financial transfers of deep sea-bed mining enterprises to the Authority. [54]

The discussion led to the adoption of the Agreement Relating to the Implementation of Part XI of the United Nations Convention of the Law of the Sea of 10 December 1982. With this Agreement, most of the rigid parts of the LOSC were modified.[55] For instance: under the common heritage conception, the parallel system of fields to be presented to the Authority for exploration was abandoned; any mandatory transfer of technology were abandoned; and the decisions of the Council of the International Deep Sea-Bed Authority, through its shift to a 2/3 majority for votes, must take into consideration more seriously any minority standpoint and, thus, especially that of the developed states.

As a result, the more rigid standpoint favoured by the developing states was replaced by a more liberal position favoured by the developed states. The same experience, as will be elaborated below, took place under the 1996 Space Benefit Declaration.[56]

During the initial stages, in 1991 a number of developing countries prepared a first set of principles for establishing a new international economic order.[57] Principle 2, No.4 stated that:

> *"In pursuing international cooperation in the utilization and exploration of outer space, developing countries should benefit from special treatment. Preference should be given to developing countries in programmes orientated towards the dissemination of scientific and technological knowledge, and no reciprocity should be asked from countries benefitting from such special treatment."*

Needless to say, the developed countries rejected this blunt institutionalization of the responsibility required by international cooperation and an automated transfer of resources.[58] What the developed countries desired was a more liberal sort of

cooperation where they could be free to determine all aspects of their cooperation whether bilateral or multilateral, commercial, or non-commercial. They also wanted to be able to choose the most efficient and appropriate mode of cooperation in order to allocate resources efficiently.[59]

The above approach was eventually accepted by the developing countries which led to the passing of 1996 Benefits Declaration. Para. 2 reads:

> *"States are free to determine all aspects of their participation in international cooperation in the exploration and use of Outer Space including the Moon and Other Celestial Bodies. It shall be carried out for the benefit and in the interest of all States, irrespective of their degree of scientific and technical development, and shall be the province of all mankind. Particular account shall be taken of the interests of the developing countries."*

From the foregoing, it is evident that both the developed and developing countries agree to the need for cooperation, but differ as to the degree of such cooperation. A liberal approach to such cooperation frees the developed countries to determine their boundaries in such agreements and, most importantly, attracts their interest in the resolutions and treaties, an interest which is greatly needed if the mankind provisions are to bear fruit and the developing countries are to benefit at all. At the same time, the very fact that the areas concerned are declared mankind territories ensures the dominance of law over absolute freedom of action of a nation or a group of nations.

SUMMARY

Common interest literally means that something is of universal concern or significance. According to the OST outer space is a province of all mankind. This approach is said to buttress the common interest principle. This principle is encapsulated in Article 1 paragraph 1 of the OST.

The main reasons for declaring outer space as a common interest of mankind was firstly, to promote energetically the fullest exploration and exploitation of outer space for the benefit of mankind. Secondly, to limit the freedom of economically and scientifically developed countries to avoid monopolisation of outer space by a few countries.

However the point of controversy has been in determining what is or is not to the benefit and in the interests of all countries. Most writers agree that indeed the benefits must be shared but as to what degree and the nature of the sharing and the kinds of benefits that are to accrue, that requires further elaborations and guidelines. Individual agreements between respective parties must therefore be drafted to reflect these aspects.

It is also accepted that cooperation is the key to countries maximizing their investments in space activities. Further that a balancing exercise must be made between the interests of the developed countries and those of the developing countries. The point of departure is the common interest principle. From the examples of the development of the LOSC and the 1996 Space Benefits Declaration discussed above, it is clear that a less restrictive approach to the common interest principle leads to more successful cooperation than a restrictive approach, with the developed countries preferring a more liberal approach that allows them freedom to determine all aspects of their cooperation. It is true that article 1 paragraph 1 of the OST is a general provision that does not stipulate how the benefits or interests of all nations should be determined nor how cooperation should be carried out, however, one can deduce that in terms of the provision, space-faring countries should at the very least, enable the non-space-faring members of the international community to participate more actively in space exploration and use.

CHAPTER 4

The ITU Regulatory regime

The allocation of exploitation rights in the GSO is governed under an international allotment regime created through the ITU, the oldest specialized agency of the UN.[60] Before proceeding to discuss ITU regulatory methods of the GSO, a review of the ITU's structure and activities seems appropriate.

(1) History and structure of the ITU

The ITU can trace its official existence to the International Telegraph Convention of 1865.[61] This Convention, together with its annexed Telegraph Regulations, established common rules for European telegraphy. The Convention was followed by the 1875 St. Petersburg International Telegraph Convention which aimed to revise and expand the 1865 Paris Convention into an instrument that would last until 1932. The 1875 Convention, which consisted of periodic meetings of the Telegraph Conferences and the Berne Bureau (a permanent international organ, the official title of which is the international Bureau of Telegraph Administrations, located in Berne/Switzerland), came to be known collectively as the International Telegraph Union. In 1906, the invention and development of radio communication led to the adoption of the Radiotelegraph Convention (known as the "International Radiotelegraph Union") and Radiotelegraph Regulations.

The 1906 Berlin Conference followed the example of the International Telegraph Union, viz. to provide for the revision of New Regulations at Administrative Conferences. Administrative functions concerned with the Regulations were entrusted to the Berne Bureau. It was not until 1932 that the International Radiotelegraph Union convened in Madrid, Spain that a legally distinct international organisation was created. At this conference, the International Telegraph Convention and the International Radiotelegraph Convention were merged into the International Telecommunication Convention. Also, on that occasion, the International Telegraph

Union merged with the Radiotelegraph Union to form the new International Telecommunication Union (ITU).

The organisational structure of the ITU, created in 1932, reflected the basic features of its two predecessors, the *Plenipotentiary Conference* convened to revise the Convention, and the *Administrative Conference*, convened more frequently to revise the international regulations. The Berne Bureau received additional administrative functions, in particular those of the registration of frequency assignments. Subsequently, the ITU structure was reorganised at Atlantic City, United States of America in 1947. The ITU, with substantial changes in 1947, achieved the status of a "specialised agency" of the United Nations.[62]

Although the organization continued to evolve over the next forty years, the basic structure of the ITU remained largely unchanged. It was not until the 1989 Plenipotentiary Conference in Nice, France that the process of structural reform began, principally in response to perceptions that the organization was slow to manage the pace of technological change and the spread of information services throughout the globe. Though some alterations were made immediately at the Nice Conference, it was through the work of the High Level Committee appointed at the conference that major changes to the organization of the ITU were proposed. The changes suggested by the High Level Committee took effect in 1994, following their adoption at the December 1992 Additional Plenipotentiary Conference. Although some relatively minor amendments have been made to the major instruments of the organization since 1992, the ITU remains largely the same today as it was then. The ITU consists of the organs described below.

Plenipotentiary Conferences - These constitute the supreme organ of the ITU and are composed of all member states. They are mainly responsible for the revision of the International Telecommunication Convention and for the establishment of general policies and programmes, establishing a budget (including a cap on expenditures) for the organization[63] and electing various members and officers of the organization. They meet every 5-7 years.

Administrative Conferences - These are inter-governmental conferences geared mainly towards the revision of international regulations and the handling of

international communication problems. The regulations they adopt have the force of international treaties (ITU document, 1984). The administrative conferences are convened every 3-7 years.

The Administrative Council - During the period between conferences, the ITU Council acts as a proxy for those powers delegated to it by the Plenipotentiary Conference.[64]

A General Secretariat, headed by the ITU Secretary–General - This was created to bring the ITU more into line with other specialised entities of the UN. The General Secretariat is the administrative support body for the ITU as a whole.[65]

According to Article 1 of the 1992 ITU Convention, the purposes of the ITU are: 1) "to maintain and extend international cooperation among all its Member States for the improvement and rational use of telecommunications of all kinds; 2) to promote and offer technical assistance to developing States in the field of telecommunications; 3) to promote the development of technical facilities and their most efficient operation with a view to improving the efficiency of telecommunication services, increasing their usefulness and making them, as far as possible, generally available to the public; and 4) to promote the use of telecommunication services with the objective of facilitating peaceful relations.

To achieve these goals, the Union shall "effect the allocation of bands of the radio frequencies and the registration of radio frequency assignments and, for space services, of any associated orbital position in the GSO or any associated characteristic of satellite in other orbits, in order to avoid harmful interference between radio stations of different States", and also to "coordinate efforts to eliminate harmful interference between radio stations of different States and to improve the use made of the radio frequency spectrum for radio communications services and of the geostationary satellite and other satellite orbits".[66]

There are three sector units that conduct the ITU. *The Radiocommunication Sector* is tasked with the responsibility of managing the frequency spectrum, as well as the positions of geostationary satellites.[67] The *Telecommunication Standardization Sector* is responsible for questions concerning the standardization of communication

technologies, operations, and tariffs.[68] Lastly, the *Telecommunication Development Sector* is responsible for coordinating the responsibilities of the ITU as a specialized agency of the United Nations.[69] It also tasked with administering development projects funded by other organizations, conducts research into issues affecting telecommunications in developing countries[70], and otherwise promotes and organizes telecommunication cooperation and aid activities in the developing world.[71] All three sectors coordinate their respective responsibilities in an effort to minimize any overlap of their efforts.

The responsibility of managing the frequency spectrum, as well as the positions of geostationary satellites, is accorded to the Radiocommunication Sector. In accordance with Article XII of the 1992 Convention, the objective of the Radiocommunication Sector is to "ensure the rational, equitable, efficient, and economical use of the radio-frequency spectrum by all radio-communication services, including those using the geostationary-satellite or orbit satellite".

Although in the past couple of years, there has been systematic effort to simplify processes, the regulatory sources of authority for the ITU remain fairly complex. One good example is the Constitution of the ITU. The ITU's Constitution was adopted in 1992, and amended two years later. It did not, however, enter into force until 1996. Prior to the introduction of this instrument, all basic operating principles were set out in convention form. The constitutional model was a response to concerns that the basic tenets of the ITU were repeatedly being subjected to revision at each major conference.[72] The omnipresent threat of revision made reliance upon basic rules fraught with risk and undermined the authority of the organization.

The Radio regulations are an intergovernmental treaty text of the ITU containing rules for the allocation of the frequency bands, technical parameters to be observed by radio stations, and procedures for the coordination and notification of frequency assignment. The drafting, adoption and revision of the radio regulations, as well as the discussion about any other issues concerning radio-communication-related activities, is the responsibility of the World Radio-communication Conferences (WRCs[73]) of the ITU that are convened regularly every two or three years.

(2) The Allocation of Electromagnetic Spectrum and Positions

It is important to note that the ITU process does not, strictly speaking, allocate the frequencies or orbital positions that it registers. Authority to place a satellite into orbit, and employ frequencies for its use, rests with each sovereign state. The ITU acts as an efficiency-enhancing resource through which sovereign states attempt to avoid potential usage conflicts and also as a convenient forum for resolving disputes that arise. Nevertheless, the economic incentives perpetuated by the process, as well as the legal preferences accorded to successful applicants, have a significant impact on the development and operation of geostationary systems.

Under the Radio Regulations of the ITU, when a satellite operator wishes to develop a communications satellite system, it obtains the cooperation of a State Member who informs the Radiocommunication Bureau of its intention to assign a particular set of frequencies and a geostationary position to this operator.[74] Upon receipt of the Member's notification, the application is reviewed against the Table of Allocations to ensure that the frequencies employed by the proposed system have been allocated for the type of service contemplated.[75] In addition, notice of the application is sent to the appropriate State Members and the applicant's proposed frequencies are compared with the Master International Frequency Register (MIFR) to ensure that they have not already been designated for use in the same region by another operator.[76] If no difficulties are discovered during the review process, the ITU adds the operator's notification to the frequency register.[77]

This procedure serves two functions. Firstly, the process encourages the development of new systems. By establishing frequency ranges for particular types of service and providing a centralized registry of specific users, developers of communication services can reduce the risks associated with construction of such systems. With the guidelines established by the ITU and information made available through its frequency register, a developer can plan and construct its systems more efficiently and with a view towards dealing with potential interference problems.

Secondly, the system improves the quality of service and increases the likelihood of continued transmission clarity for existing users by providing a means through which prospective operators can avoid conflicts with preexisting systems. Current users are

afforded a degree of protection against interference without the need to resort to enforcement mechanisms.

Perhaps more importantly, preliminary acceptance by the ITU bestows significant priority against potential users of the same spectrum. Though some obligation to accommodate others remains when conflicts between early and later registrants arise, early registration affords a measure of legitimacy that supports the first registrant's negotiating position. Because the notification process affords preferential treatment to early registrants, it is often characterized as "first come, first served"[78], and known also as the *a posteriori* system.

The procedure provides that a country wishing to put a communication satellite into the GSO must ensure that it does not interfere with any system previously registered with the ITU[79]. While countries with existing assignments were expected to make minor adjustments to facilitate the entry of a new system, the essential burden was on the proposed new system[80].

The application of this procedure was questioned many times by the developing countries. Their argument was premised on the simple fact that in the GSO there are specific prime positions that are optimal for the placing of satellites and the other positions are not so viable. Since the space-faring nations had the economic and technological resources, therefore, they managed to place their satellites in the most sought-after positions. This had the developing countries worried about not being able to find adequate slots in the GSO by the time they could afford to place their own satellites in orbit. In addition, this practice on its own was contrary to the requirements of Article 1 paragraph 1 in that the GSO was not being used for the benefit of, and in the interests of, all countries because the degree of economic and scientific development of other countries was not considered.

The fallacy of this approach was, furthermore, that there was no strong mechanism by which to achieve efficient and economic use of the orbit and, hence, no possibility of its equitable distribution.[81] Whatever portion of the orbit was spared as a result of its (expected) efficient and economic use would again be occupied by those states which were already making use of the other portions of the orbit. This approach,

therefore, was inherently inequitable. It, thus, became evident that the continuation of this practice would merely serve to worsen the situation.

The developing countries started criticizing the *a posteriori* system with the aim of developing a new allocation procedure based on the principle of the equitable access to the GSO for all nations.

There were, thus, contrasting views regarding the proper way to manage the GSO. The developing countries requested better and equitable participation in the use of the GSO and a just distribution of the benefits deriving from its usage as part of the more general demand for the establishment of a New International Economic Order that was able to the fill the gap between rich and poor countries and that could offer the latter equal and effective possibilities of development.[82]

(3) Developments in the 1970s

In 1973 the ITU Convention was adopted. For the first time the concept of equitable access to the GSO became part of a binding legal treaty. Its article 33 stated, “In using frequency bands for space radio services Members shall bear in mind that radio frequencies and GSO are limited natural resources, that they must be used efficiently and economically so that States or groups of States may have equitable access to both in conformity with the provisions of the Radio regulations according to their needs and the technical facilities at their disposal”.

The Bogota Declaration, discussed in Chapter 3 above, also made a huge impact at this point in time. As stated earlier, in 1976 the equatorial countries also called for international administration of the rest of the GSO and suggested how to handle the environmental aspects related to its use. Although the Declaration garnered little support and was rejected completely by most countries, the seeds to ensure equitable access of the GSO had been sown. The Declaration was effective in bringing international attention to the concern of developing countries about the use of outer space and its resources.[83] The Declaration, therefore, represented a useful instrument for supporting the requests from the developing countries for the

equitable distribution of space benefits, and, as a consequence, for the systematic and internationally regulated use of the GSO.[84]

Following the Declaration, most developing countries were motivated to put pressure on the ITU to consider their lack of access to the GSO. The issue became so significant that at six ITU conferences, the WARC 1977, 1979, 1982, 1985, 1988, and WARC 1999, the issue of access to the GSO was made an agenda item.

Stemming from a special WARC in 1971 the goal of which was to set up an *a priori* plan, which would allocate frequencies and orbital positions on a worldwide basis for broadcasting satellite services, the 1977 Conference on Direct Broadcasting Satellites laid down a plan attributing to every single member of the ITU a geostationary position and frequencies to distribute programmes to a determined area.

During WARC 1977, the ITU also considered, for the first time, its role in reconciling its lack of direct competence over GSO position assignments with its mandate to coordinate the efficient and economic use of the radio spectrum.

At the 1979 WARC, the developing countries submitted their demands for equitable access to the GSO and a new allocation system of the orbit/spectrum resource with precise direction. Consequently, the 1979 WARC adopted two non-binding resolutions[85]. Resolution 2 called for equal rights for all countries to use the orbit/spectrum resource. It clearly affirmed that neither registration by the International Frequency Registration Board of frequency assignments made by a country, nor their use should confer permanent priority on any country (or group of countries). Such registration and use were not to prevent the establishment of space systems by other countries.

The way towards an amendment of the *a posteriori* allotment approach, at least for a few frequencies and orbital positions, was opened through Resolution 3. Resolution 3 established the convening of a two-part WARC, the first to be held in 1985 and the second in 1988, specifically dealing with the use of the GSO and the planning of space services utilizing it. The goal of those conferences was “to guarantee in

practice for all countries equitable access to the GSO and frequency bands allocated to space services."

To sum up, the genesis of the *a priori* system was such that: equitable access to an efficient and economical use of the orbit/spectrum resource was guaranteed; there was an acknowledgment that such a resource was limited; the concept that no nation has a permanent priority on its use; and that such use is limited in time. It is therefore evident that by the end of the 1970's a number of principles were incorporated into the ITU regime and this set the course for the 1980s.

(4) Developments in the 1980s

The 1985 WARC-ORB Conference decided on the principles and procedures to govern the coordination and planning of the GSO. This was followed by the 1988 Conference to implement the plan and allot positions and frequencies.

Partly in response to the position of the developing countries, [86] in 1982 the ITU added a phrase to Article 33 of the International Telecommunication Convention referring to *"taking account .... the geographical situation of particular countries"* in the question of access to the GSO so that it read:

"... Countries or groups 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."

As a result, the needs of the equatorial countries and those of the developing countries are taken into consideration in allocating frequency bands. The article gave full recognition to the request of the developing countries to achieve a balance in the use and management of the GSO. The article also emphasized that equity was not to be measured simply in terms of efficiency and economy.

The most successful application of the equity principles to the GSO arose out of negotiations during the sessions of the WARC '85 -'88. The result was a compromise

that produced a hybrid system which combined the “first come, first served” system with an *a priori* allotment system.

This meant that, for countries which have not given detailed consideration to the problems of acquiring a satellite but wish to reserve their rights, a long term planning procedure which reserves assignments for all interested countries was developed.

A priori planning was strongly supported by the developing countries. It is crucial in effecting equitable access to the orbit spectrum resource. Such sharing was not possible on the basis of the “first-come, first-served” principle. The determination of equitable access is influenced by various factors, and the developed as well as the developing countries are allotted orbital positions and radio frequencies according to their needs.[87]

Under the plan, each ITU Member was granted an allotment consisting of a nominal orbital position which represented a centre point around which to base a maximum ten degree arc on the GSO,[88] eight hundred megahertz of bandwidth, and a designated service area roughly equivalent to each Member’s terrestrial borders.[89] The allotments should not be confused with actual reserved assignments of positions and frequencies for fixed satellite service. They resemble a right of coordination priority more closely. The actual positions and frequencies remain available for use under the traditional allocation process; it is only when a Member begins the process of notification that the allotment plan becomes a factor in the distribution process.

In general terms the allotment plan appears to be viable and reasonable compromise that deals carefully with the concerns of the developing states, allowing a gradual integration of national networks, and maintaining the existing regulatory mechanisms wherever possible. However, the reality is that the plan offers potentially equal rather than equitable access; moreover, economic realities have thus far made actual exploitation of the GSO viable only for those states with sufficient resources.[90]

There is some question about whether the WARC ’85 -‘88 allotment plan fully advances the goals of the ITU. The difficulty is that equity is not the same as equality of opportunity; equity implies that some measure of rights to the benefits derived

from a natural resource, such as the GSO, should accrue to all states regardless of their relative ability to exploit the resource directly. The plan does not protect nor confer these rights to states. In the result the principles established at WARC '85 -'88 fall short of full equitable distribution.

It has now been accepted though that equitable access does not amount to equal access[91], and, furthermore, that the considerations of economy or efficiency are not necessarily compatible with the factor of equity. It may be fair and necessary to provide all countries with the possibility of occupying an orbital position; it is, however, clear that not all countries have the same resources and technology capabilities. A balance must be struck between the fair and just distribution of the GSO with its efficient and economic use.

According to Fabio,[92] since efficiency, economy, and equity may be conflicting concepts, a significant effort has to be made in order to accommodate the interests of both the developed and developing countries. This requires an analysis of the current situation and the needs of the parties involved so that the purpose of distributive justice may be reached.

(5) Problems with the current allotment systems

A posteriori - (a) Paper filings

The relatively low costs of filing an individual application with the ITU for a particular orbital position are grossly inadequate to deter developers from attempting to seize the potentially significant financial benefits associated with a valid registration. Consequently, developers have raced to file as many applications as their resources permit as quickly as possible and have thereby prevented others from doing the same. This problem is exacerbated because developers are aware that there are far more applications than positions capable of accommodating them.[93] Developers file still more applications than they expect to use to ensure that they will be granted the number of positions actually required for operating their contemplated networks.[94] They have also filed for swaths of spectrum or geographic coverage in

excess of their present need in order to handle potential growth, whether such growth is realized or not.[95]

The phenomenon of paper filings is a real, continuing problem, although the ITU has taken certain measures to try to discourage it. One of the measures previously taken was to reduce the time period by which a satellite must be placed in orbit from nine to seven years. The time scale in most cases now is seven years after the country initiates the registration for the slots. If, in those seven years, one has not informed the ITU of the implementation of the project, the country will be requested to confirm the status of the project, and, if there is no justification that the system is operational, the registration will be cancelled.

Because of the demand to gain access to space, the role of the ITU is more important than ever. The role of ITU and the Radio-communication Bureau in particular, is even more important than it was before, because the situation is becoming more and more complex with the appearance of new services and new users and the more complicated sharing situation on the orbit.

The big problem is that there are only a limited number of orbital positions from which it is possible to cover key markets, and so, even if ITU opens up orbital positions around these locations, it is difficult for new operators to make as good a business case as those already operating. There is, nevertheless, some room for the ITU to monitor and manage the coordination system that exists more aggressively so that operators who do not achieve coordination of their satellites give way to those waiting in line behind them.

To sum up, in order to regulate access to the orbit, the ITU has adopted new rules incorporating concepts like “use it or lose it” and introduced a “user must pay” principle for the advantages it gives rise to. Presently, the ITU requires due diligence of an application for an orbital slot.[96] That is, the State that desires interference-free access to a particular orbit position must show convincingly its intention to use the desired position and must actually use it within a predetermined fixed period of time.

A posteriori – (b) Selling of rights

There are a number of entities that file applications not for the purpose of operating a satellite network but instead to sell the rights secured to operators.[97] It is believed that warehousing, leasing, or auctioning the orbit/spectrum resource is in conflict with the concept of equitable access and efficiency, more especially because the practice favours only the most industrialized and wealthy countries, by undercutting both goals of equitable access and efficiency.[98] Such practice, furthermore, goes against the values of the article 1 of the OST because the acts do not benefit all countries but are for the private benefit of the seller only.

A priori procedure

With this system, the fact that there is no requirement for potential users to demonstrate either need or technical capability to use an assignment is a major challenge. This is where the imbalance between equity and efficient and economic use comes to the fore. Although this system was viewed as a win for the developing countries, the question remains about whether it is economically efficient to afford a developing country the opportunity to hoard orbital multiple slots that it is not using and will never use. Questions abound as to whether this system by itself does not even defeat the purpose of equitable access to the GSO.

(6) Way forward?

(a) Creative ways to access orbital slots

A major source of information on creative ways to access the GSO and its associated spectrum has been an excellent feature by Mark Holmes, 2008 from which the following sub-chapter has largely been drawn[99]. It is accepted that despite the advances in technology and improvements in the administration of orbital slots, the playing field for orbital slots still remains crowded. Experts, however, believe that it all depends on frequency bands. Spectrum is attached to frequency bands and to

service type. Ku-band slot with 2-degree spacing and the right elevation is certainly the most difficult to find.

The best way to help to create more space for new satellites is likely to be the development of other frequencies such as Ka-band. Orbital slots at C- and Ku-band are found to be in relatively short supply, largely for historical reasons. There are probably, however, a large number of available orbital slots at Ka-band for a couple of reasons. Although there were a number of Ka-band filings in the late 1990s by various administrations, these filings were not likely to be quite as extensive as the collective filings to date for C- and Ku-band frequencies, which have a much longer track record. Moreover, many of the original Ka-band filings are now likely to be on the verge of expiring since so few Ka-band systems have actually been brought into service to date.

The good news is that even though a particular slot is fully utilized for Ku-band over the Northern Hemisphere, there is still potential for the same slot to be used for service at either Ku-band or other frequencies in the Southern Hemisphere. This is a matter of satellite design and is an area with great potential. Other technology enhancements can also be considered that might reduce the spacing required between satellites without causing interference.[100]

Accordingly, this includes:

> "*advances in satellite technology, which makes it possible for satellites to be operated more closely together. When satellites were first launched in the 1960s and 70s, it was believed that satellites needed separation of a number of degrees in space to avoid interference problems. Over time, however, the nominal standards for separation informally evolved first towards 3-degree separation and, later, and more formally — largely at the prodding of the U.S. FCC (Federal Communications Commission) — to 2-degree spacing. Whether satellite separations appreciably less than 2-degree spacing may be feasible in the future remains to be seen. But even the difference between 3-degree spacing (which in a geosynchronous plane would limit the possible number of satellites in a particular frequency band to 120 orbital slots) as contrasted with 2-degree orbital spacing (which would limit the*

possible number of satellites to 180) is considerable. In addition, advances in ground station technology can help expand the utilization of spectrum to the same effect. So, it is not just a matter of opening up new orbital slots but also how the satellite networks operate in the naturally limited number of slots available".[101]

There also are other factors relative to the technology that have an impact on the issue. The use of hybrid satellites is another factor that may contribute to the relative inefficiency in the use of orbital resources, since satellites with transponders operating in both frequency bands are less likely to employ maximum frequency re-use techniques in either band, although the use of hybrid satellites may nonetheless offer certain countervailing flexibility advantages.

Another way to get around the fact that orbital slots are at a premium is employing the use of larger satellites. Rather than orbital slots, countries should be more concerned with the amount of allocated spectrum because, as an example, if a country has five satellites in a particular orbital position, one of the things they could do with their replacement strategy is to replace multiple satellites with single satellites. This entails buying bigger more powerful satellites. They can have as many satellites in a slot as they have spectrum to use. It is also possible to share a slot between satellites and even operators if there is spectrum available. Depending on the nature of the spectrum, it is possible to place more or fewer satellites in a given arc.

Another move that may free up some slots is regional consolidation and also buying the slot owners. This is what Intelsat did with PanAmSat and Loral's North American assets.[102] It was not done simply to acquire slots but also to become players in the more lucrative video market, and it was the only way Intelsat could have gained so many slots.

(b) Increasing the efficiency of the existing institutions

Some experts believe that the question at this point is whether we should look for new mechanisms or organizations to manage the allocation of limited resources, or increase the efficiency of the existing institutions[103]. According to Victor Strelets[104], if

we take the first approach, the question that needs to be answered is how equitable access of different countries or groups of countries to the limited natural resources can be guaranteed, taking into account the special needs of the developing countries and the geographical situation of particular countries.

Obviously the developing countries would be pleased with this angle but one must be mindful of the delicacy and complexity of the issue. It literally involves political, economic, and strategic interests of countries, as well as the strong economic interests of existing satellite operators. Considering the length of time it takes to reach consensus on major issues on the international platform, there is no telling how long it would take for this approach to come to pass. Furthermore, the ITU is the only specialized agency with practical experience in managing orbit/spectrum resource under the UN system.

The second approach, calling for improvement and enhancement of existing regulatory principles, might, therefore, be considered the most effective solution. To this effect, Victor Strelets[105] proposes the following course of action:

(i) Improvement of the ITU rules and procedures for the allocation of the orbit/spectrum resource;

(ii) Adoption of the organizational and technical measures to eliminate interference, including interference to satellites; and

(iii) Promoting the legal value and status of the decisions taken by the Radio Regulations Board.

(i) Improvement of the ITU rules and procedures for the allocation of the orbit/spectrum resource

At the WRC-2012 a number of decisions were adopted enabling to improve procedures for the use of the orbit/spectrum resource. These decisions included:

New wording for No.11.49 of the Radio Regulations (RR) was adopted, which clearly states the possibility of suspending the use of a recorded frequency assignment to a

space station for the period of up to three years. In this case, the notifying administration shall, no later than six months from the date on which the use was suspended, inform the Bureau of this date.

RR No. 13.6 authorized the Radio Regulations Board (RRB) to take decisions on the cancellation or modification of an entry for a recorded frequency assignment to a space station where the assignment in question had not been brought into use, or was no longer in use, or continues to be in use but not in accordance with the notified characteristics.

RR No. 11.44B set clear criteria to consider a frequency assignment to a space station in the GSO as having been brought into use.

RRB is authorized to consider the *force majeure* cases related to satellite launch.

The RRB, as well as the ITU Radiocommunication Sector, continuously focus on improvement and simplification of the regulatory procedures for the GSO/spectrum resource in drafting proposals for the forthcoming 2015 World Radio-communication Conference.[106] Agenda item 7 of WRC-15 instructs the Conference "to consider possible changes, and other options, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, and advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution 86 (Rev.WRC-07) to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit."[107]

(ii) Adoption of the organizational and technical measures to eliminate interference, including interference to satellites

Only the ITU is responsible for resolving the interference caused by stations on the territory of another state and interference that occurs in satellite communication systems. This is done through the application of the Radio Regulations procedures using their detection and interference source location. The problem is that, over time, incidents of intentional interference have increased in number and duration resulting in the workload rising beyond the capacity of the ITU. Independent monitoring

stations within the ITU international satellite monitoring system need, hence, to be used in order to resolve the issue.

The Radiocommunication Bureau (BR), furthermore, considers the establishment of agreements on cooperation with administrations that have the capacity to monitor the use of spectrum allocated to satellite services in order to assist the BR to perform measurements related to cases of harmful interference for which an administration is seeking the assistance of the BR.[108]

It must be noted, however, that an agreement between ITU and a national administration affects the interests of third countries; such activity, therefore, could be undertaken on the basis of international agreements adopted by Plenipotentiary Conference or on its behalf based on the appropriate ITU Council decision.[109] An agreement between ITU and a national administration, furthermore, has financial implications related to maintenance and usage of monitoring stations belonging to the international satellite monitoring system, and, therefore, organizational, technical, and financial interaction between BR and a national station belonging to the international satellite monitoring system should be determined.[110]

The establishment, adoption, and widespread use of the international monitoring independent stations could be tackled through the mechanism for discussing regional initiatives within ITU for their adoption by a World Telecommunication Development Conference (WTDC).[111]

(iii) Promoting the legal value and status of the decisions taken by the Radio Regulations Board

The ITU has no enforcement mechanism for its regulations. It, therefore, relies exclusively on member countries to exercise their good will towards cooperation and the spirit of compromise in addressing complicated tasks. In resolving cases of harmful interference cases, the RRB and the BR act in accordance with the procedures of RR Article 15. In turn, the parties exercise their utmost goodwill and mutual respect and adhere to the instruments of the Union.

This has been the procedure for dealing with disputes since the ITU was established. It is suggested that departing from this practice and adopting any type of sanction-based approach to resolving issues such as harmful interference would be a momentous step that would change the face of ITU and the relationship between BR, RRB, and administrations. There are ways, however, in which the RRB decisions can be given value and recognition. In the case of the violation of international treaties it is recommended that using RRB decisions as evidence in proceedings before the courts of different instances be considered.

In conclusion, the above sub-chapter illustrates that to ensure equitable access to the orbit and associated spectrum; more has to be done to create additional room for more spacecraft. Most industry experts agree that more can be done to free up slots and developing existing locations more effectively than is the case at present and that issues, such as frequency bands and the separation of satellites, are central to this progress. As satellite operators seek to make the most of their orbital slots, developments in satellite technology and a more progressive approach by the ITU offer the most promising methods to meet this goal. This calls for an improvement and enhancement of existing regulatory principles of the ITU.

SUMMARY

Basically Chapter 4's objective was to consider the role of the ITU in regulating the GSO. The ITU is made up of the Plenipotentiary Conferences and the Administrative Conferences which deal with amendments to the ITU Convention and Constitution, and the ITU regulations respectively. Of the three sectors that conduct the ITU, the Radiocommunication sector is particularly important for our purposes for it deals with allocation of bands to the radio frequency spectrum and positions in the GSO and associated spectrum.

Initially, allocations to the GSO were done through the *A posteriori* system which gave preference to the country that applied first. This system was challenged by

developing countries for being unfair and contrary to affording equitable access to outer space and its benefits to all nations as required by Article 1 paragraph 1 of the OST. As a result the ITU through its WRCs of 1977 to 1988 eventually came up with a hybrid system made up of the *A posteriori* and *A priori* systems.

It is true that the hybrid system strikes a compromise that alleviates the developing countries' concerns of being frozen out of direct benefits from geostationary telecommunication networks; however, there is some question, whether the WARC 85-88 allotment plan fully advances the ITU's goals. It may be fair and necessary to provide all countries with the possibility to occupy an orbital position however, it is clear that not all countries have the same resources and technology capabilities. A balance must be struck between the fair and just distribution of the GSO with its efficient and economic use.

The chapter also considered the problems of the two systems. For the *A posteriori*, paper filings and selling of slots pose a major challenge to the system while under the *A priori* system, the effectiveness of the system itself is questionable. Although this system was viewed as a win for the developing countries, the question remains whether it is economically efficient to afford a developing country the opportunity to hoard orbital multiple slots that it is not and will never use.

A way forward is proposed here in terms of creative ways to access orbital slots and increasing the efficiency of the ITU. With regard to creative ways to access the GSO, experts believe frequency bands hold the answer, as well as improvements in satellites technology and regional consolidation. Regarding the latter proposal, it is suggested that with the ITU being the only specialized agency with practical experience in managing orbit/spectrum resource under the UN system, the best way forward would be improvement and enhancement of existing regulatory systems of the Union.

CHAPTER 5

CONCLUSION

The Bogota Declaration, although it was legally and scientifically untenable,[112] created, through its principles on equity and fairness, a platform for the consideration of the development of legal principles to govern the use of the GSO.[113] The Declaration indirectly led to very important changes in the ITU, and it paved the way for some form of equitable access to the GSO by developing countries.

International law (OST) does not stipulate exactly how states ought to participate in, or share the benefits of, the use and exploration of outer space. Article 44 of the ITU Constitution, however and the existing practice of ITU in regulating the GSO can be deemed to be a step forward in fulfilling the requirement in article 1 paragraph 1 of the OST for some form of cooperation to ensure participation by developing countries. This also satisfies the 1996 Space Benefits Declaration by justifying some form of sharing of the benefits of the use and exploration of outer space.

Article 44 of the ITU Constitution refers to both the behaviour of Member States and the legal nature of the GSO.[114] Regarding the first aspect, ITU Member States are requested to endeavour to limit the number of frequencies and the spectrum used to the minimum essential to provide the necessary services in a satisfactory manner, and to apply the latest technical advances as soon as possible. This provision is clearly linked to the general principle of *civiliter uti* which goes together with the concept of common good (*res communis omnium* of Roman Law), which we could also define as a duty of sustainable use.[115]

The second, and more important, aspect, “radio frequencies and any associated orbits, including the GSO, are *limited natural resources* and ... must be used rationally, efficiently and economically ..., so that countries or groups 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*.”

In this way, the legal concepts adopted by article 44 of the ITU Constitution, which are indeed in line with the provisions of the OST (freedom of exploration and use, benefit of all countries, province of humankind, non appropriation), are now also reflected in and form part of general international law.[116]

According to Sergio Marchisio, evidence that these concepts form part of general international law is given by the Agreement on the GSO status reached in 2000 within the UN Committee on the Peaceful Uses of Outer Space (COPUOS), which has been "noted" with satisfaction in paragraph 4 of UNGA resolution 55/122 of 8 December 2000. This Agreement corresponds to the norms of general international law regarding the character and utilization of the GSO, norms which have the same content and are binding *erga omnes.*[117]

Suffice it to say that at the time, the 2000 Agreement settled the dispute concerning the legal status of the GSO raised by the Bogotá Declaration and article 44 of the ITU Constitution was recognised as the applicable norm.[118] It was, furthermore, agreed that, in order to facilitate equitable access to the orbit/spectrum resource according to the ITU system based on the principle of "first come, first served," in the case of comparable requests for access to the spectrum/orbit resource by a country already having access to the orbit/spectrum resource and a developing country or another country seeking it the country already having such access should take all practicable steps to enable the developing country or other country to have equitable access to the requested orbit/spectrum resource.[119]

One of the challenges currently facing the international community is the efficient use of spectrum and orbital resources. This challenge is intensified by the fact that developing nations can now be assigned orbits in relation to their geographical location, and this is despite the fact that some of these countries do not use these orbits. Although this is a great development of which the Equatorial countries ought to be proud, this development must, however, be balanced by the need to use the GSO economically and efficiently. Reaching this balance has proved to be elusive to say the least, and this is exacerbated by the proliferation of paper filings, selling of slots, and the fact that there is no requirement for potential users to demonstrate need or technical capacity.

The ITU made big leaps in progress through the outcomes of the WRC-12. The conference considered amongst others, the apparent congestion of spectrum/orbit resources that results from the existence of rights which are not being used in practice. A minimum period of three months of operation was established to consider that a satellite network has been brought into service and that its rights are confirmed. The WRC-12 further requested the RB to enquire into situations where the same satellite may have been used to maintain the rights of inactive networks at various orbital locations by "jumping" from one location to another.[120]

Finally, currently, the ITU is a leading UN agency for the global management of the radio-frequency spectrum and satellite orbits, so it is appropriate that problems of interference considered earlier be treated and resolved within the ITU through the application of the ITU Constitution, Convention, and Radio Regulations and on the basis of the utmost goodwill and mutual assistance. Improvement of the ITU rules and procedures and the implementation of the organizational and technical measures to eliminate interference among satellite communication systems would also be a welcome development. And, of course, all states should exercise the utmost goodwill and mutual respect and adhere to the instruments of the Union.

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[2] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, adopted by Resolution 2222 (XXI) of 19 December 1966, 610U.N.T.S 205 (hereinafter "1967 Outer Space Treaty", "OST").
[3] Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries, Resolution 51/122 of 13 December 1996.
[4] I.H. Ph. Diedericks-Verschoor and V. Kopal, *"An Introduction to Space Law"* 2008, 3rd Ed. Wolters Kluwer. Page 99.
[5] Ibid.
[6] G.C.M. Reijnen and W. De Graaff "*The Pollution of Outer Space, in Particular the Geostationary Orbit"* Martinus Nijhoff Publishers 1989 at page 3.
[7] Ibid.
[8] R S Jakhu, "*The legal Status of the Geostationary Orbit"* (1982) VII Annals of Air and Space Law 333f.
[9] R. S. Jakhu, *supra* note 8, at page 14.
[10] Ibid, at page 15.
[11] Ibid.
[12] Reijnen and de Graaff *Supra* note 6, at page 25.
[13] R. S. Jakhu, *supra* note 8, at page 16.
[14] R. S Jakhu, *supra* note 8, at page 25 – quoting UN Doc. A/CONF. 101/BP/7 (January 16 1981) 10.
[15] R. S Jakhu, *supra* note 8, at page 127.
[16] Fabio Tronchetti, The Exploitation of Natural Resources of the Moon and Other Celestial Bodies: A Proposal for a Legal Regime. Studies in Space law/4, Martinus Nijhoff Publishers 2009.
[17] Phetole Sekhula, *supra* note 1.
[18] OST Supra note 2, at Article II.
[19] Ibid, Article IX.
[20] Phetole Sekhula, *supra* note 1, at page 4. The question whether Treaty law can coexist with a rule of international customary law and be applicable in the relations between the same countries has been answered in the positive. See, Military and Paramilitary Activities in and against Nicaragua, (Merits) (Judgement) [1986] ICJ Rep.
[21] R. S. Jakhu, *supra* note 8.
[22] Declaration of the 'First Meeting' of Equatorial countries, signed at Bogota, Colombia on December 3, 1976. The Declaration is reprinted in Jasentuliyana N. and Lee R.S.K. (ed), Manual on Space Law. (Doobs Ferry) 1979 Vol. II, at page 383 et seg.

[23] See, Lubos Perek, Actual Situation in the Goestationary Orbit, 2012 Proceedings of the Institute of International Space Law, Eleven International Publishing, The Hague at page 610.
[24] Marietta Benko and Engelbert Plescher, Space Law: *Reconsidering the Definition/Delimitation question and the Passage of Spacecraft through Foreign Airspace.* Eleven International Publishing, 2013 at page 41.
[25] Ibid.
[26] Resolution 2692 (XXV) of the United Nations General Assembly entitled "Permanent Sovereignty over the Natural Resources of Developing Countries and Expansion of Internal Accumulation Sources for Economic Developments".

[27] Article 2, Charter on Economic Rights and Duties of States solemnly adopted by the United Nations General Assembly through Resolution 3281 (XXIV), once more confirms the existence of a sovereign right of nations over their natural resources.

[28] Marietta Benko and Engelbert Plescher, supra note 25.
[29] Ibid.
[30] S. Freeland and R. Jakhu, *"Article II of the Outer Space Treaty"* Cologne Commentary on Space Law. Vol 1. Carl Heymanns Verlag (2010) at page 50 and 51. See also Nemitz v N.A.S.A., 126 Fed Appx. 343 (9th Cir. (Nev.) (10 February 2005).
[31] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, adopted by Resolution 34/68, done 5 December 1979, 1023 U.N.T.S
[32] See Freeland and Jakhu, *supra* note 31 at page 54 para 40.
[33] Ibid, para 42.
[34] Ibid, para 43.
[35] United Nations Convention on the Law of the Sea of 1982.
[36] For details, see R S Jakhu, *supra* note 8.
[37] UN General Assembly Resolution 1348 (XII) of 13 December 1958.
[38] R. S. Jakhu, *supra* note 8 at page 111.
[39] Ibid.
[40] Ibid.
[41] Ibid.
[42] Stephan Hobe, "*Outer Space Treaty"*, Cologne Commentary on Space Law. Vol 1. Carl Heymanns Verlag (2010) at page 38 para 51.
[43] Ibid.
[44] S. Gorove, *The Geostationary Orbit: Issues of Law and Policy.* The American Journal of International law, Vol. 73, No. 3 (July 1979), page 448.
[45] Ibid.
[46] Ibid at page 449.
[47] Stephen Hobe, "*Common Heritage of Mankind – An outdated concept in international space law?"* IISL-98IISL.4.06 at page 272.
[48] Ibid.
[49] J. I. Gabrynowicz *The "Province" and "Heritage" of Mankind Reconsidered: A New Beginning.* The Department of Space Studies, Center for Aerospace Sciences, University of North Dakota, Grand Forks ND 58202 - 7306 (Second Conference on Lunar Bases and Space Activities, Houston Texas, 5-7 April 1988) at page 694.
[50] N. Jasentuliyana, Ensuring Equal Access to the Benefits of Space Technologies for all Countries. Space Policy 1994 Butterworth-Heineman Ltd, 10 (1) at page 8.
[51] Ibid.
[52] Ibid.
[53] J.I Gabrynowicz *supra* note 50, at page 694.
[54] Hobe *supra* note 47 at page 278
[55] Ibid.
[56] 1996 Benefits Declaration, *supra* note 3.
[57] Stephan Hobe *supra* note 36 at page 279, quoting UN Doc. A/AC. 105/C.2/l. 182 of 9 April 1991.
[58] Ibid at page 279
[59] Ibid, quoting UN Doc.A/AC. 105/C,.2/L. 197 of 27 March 1995.
[60] Freeland and Jakhu, *supra* note 19, at page 61 para 70.
[61] International Telegraph Convention, May 17, 1865, 130 Consol. T.S. 198.
[62] On 15 November 1947, an agreement between ITU and the newly created United Nations recognized ITU as the specialized agency for telecommunications. The agreement formally entered into force on 1 January 1949. See: http://www.itu.int/en/history/Pages/ITUsHistory-page-3.aspx, last visited on 10 December 2014.
[63] Convention to the International Telecommunication Union (Geneva, 1992), art. 8(2)(c)
[64] Ibid. art. 10(3).
[65] Ibid. art. 11.
[66] Art 1. Para. 2, 1992 ITU Convention.
[67] Ibid. art. 12
[68] Ibid. art. 17
[69] Ibid. art. 21(1)(1)
[70] Ibid. art. 17(1)
[71] Ibid. art. 21

[72] Gregory C. Staple, Current Development: *The New World Satellite Order:* A Report From Geneva, 80 Am. J. Int'l L. 699, 720 (1986).
[73] According to the Final Acts of the Plenipotentiary Conference (ITU, Kyoto, 1994) and the ITU Constitution, Art 11 (a) and 11 (b), the WRC's have replaced the WARC's.

[74]Lawrence D. Roberts A Lost Connection: *Geostationary Satellite Networks and the International Telecommunication* Union 15 Berk. Tech. L.J. 1095 (2000) at page 10– HeinOnline (last visited 15 July 2014)

[75] Ibid
[76] Ibid
[77] Ibid

[78] Henry Wong, Comment, *2001: A Space Legislation Odyssey—A Proposed Model for Reforming the Intergovernmental Satellite Organizations*, 48 Am. U. L. Rev. 547, 558 (1998).
[79] N. Jasentuliyana and R. Chipman, *"Developing Countries, the GEO and WARC-ORB 85 Conference"* Space Policy August 1985 at page 245.
[80] *Ibid.*
[81] R.S. Jakhu, *supra* note 8, at page 341.
[82] Fabio Tronchetti, *supra* note 16, at page 173.
[83] Ibid at page 177.
[84] Ibid
[85] N. Jasentuliyana and R. Chipman, *supra* note 78 at page 244.
[86] N. Jasentuliyana and R. Chipman, *supra* note 66, at page 245.
[87] See R S Jakhu, *supra* note 11 at page 359.
[88] Art. 5 of International Telecommunication Union, ITU Radio Regulations 1998, reprinted in 2 Space Law: Basic Legal Documents, at C.IV.2.1 (Karl-Heinz Böckstiegel & Marietta Benkö eds., 1999)
[89] Ibid art. 7.

[90] See *Report to the Special Committee of the Radiocommunication Study Groups* § 3.1, ITU Doc. SC97-2/2-E (1996)
[91] Fabio, *supra* note 16, at page 180
[92] Ibid.
[93] Ibid at page 183.
[94] Ibid
[95] Ibid.
[96] WRC Resolution 49 adopted at WRC 2012. A licensing state must ensure that an application is technically sound.
[97] Fabio, *supra* note 16, at page 184
[98] Ibid at page 186
[99] Mark Holmes, Hot Orbital Slots: *Is There Anything Left?* March 1 2008. Link: *www.satellitetoday.com/.../via.../hot-orbital-slots-is-there-anything-left/* last visited 16 July 2014.
[100] Ibid.
[101] Ibid.
[102] Ibid.
[103] Victor Strelets, Satellite Communications and Space Governance in the Coming Years - *International Regulation of Frequencies and Satellite Orbits: Improving Rather than Revising ITU's Procedures. For a collective Book titled:* Governing the Geostationary Orbit: Orbital Slots and Spectrum Use in an Era of Interference. Coordinated by Guilhem Penent *January 2014, IFRI Space Policy Programme at page 71.*
[104] Ibid.
[105] Ibid.
[106] Ibid.
[107] Ibid.
[108] Ibid.
[109] Ibid.
[110] Ibid.
[111] Ibid.

[112] S. Gorove, *supra* note 31 at page 455.
[113] Ibid.
[114] Sergio Marchisio, The ITU Regulatory System: a Self-Contained Regime or a Part of International Law? *For a collective Book titled:* Governing the Geostationary Orbit: Orbital Slots and Spectrum Use in an Era of Interference. Coordinated by Guilhem Penent *January 2014, IFRI Space Policy Programme* at page 75.
[115] Ibid.
[116] Ibid.
[117] As detailed in the document paper by the Legal Subcommittee at its thirty-ninth session under the title "Some aspects concerning the use of the geostationary orbit" (A/AC.105/738, annex III).
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[119] Ibid.
[120] Ibid at page *74.*

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