LACUNAE, FLAWS AND INEQUITY IN SPACE LAW FROM THE PERSPECTIVE OF THIRD WORLD COUNTRIES

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This paper is divided into 3 parts, i.e. one is on an overview of space activities, focusing on how the uses of Outer Space can prosper and vest Space Powers with economic, political and military supremacies and how satellites have become an essential component in our daily life, another one identifies some lacunae, gray areas and flaws in the existing international Space Law, e.g. lack of authoritative criteria for the determination of where airspace ends and where Outer Space begins; lack of comprehensive corpus of lex lata dealing with the rapidly accumulating multitudes of demised satellites and Space debris that jeopardize the security of the astronauts' life and Man's activities in Outer Space, and the last one singles out and comments on the inequity for Third World countries in Space Law and current State practices, e.g. defective regime and inequity for Third World countries in the allocation of orbital slots and physical access to geo-stationary orbit; unethical and abusive exploitation of data on other countries secured via remote-sensing; and restriction of opportunity for Third World countries to directly participate in the elaboration of Space Law, coupled with recommended rectifications and remedial measures.

1. Introduction

Outer Space, the final frontier of Mankind, is governed by a *corpus* of international Space Law, both in the conventional and customary forms, which is a relatively new branch of international law, that is still unsurprisingly honeycombed with *lacunae*, gray areas, flaws and inequity for Non-Space Powers, stemming from its quasi-ignorance by a staggering number of the Third World

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countries, which have erroneously regarded Space Law and Outer Space activities as by far too remote from their daily life's concerns to be taken seriously: an indeed regrettable fallacy, which has accounted for their retard in Space technology and meager contribution, if any at all, to the past and present development and orientation of Space Law. Hence, the numerous consequential shortcomings which have in many instances been frustrating and detrimental to Third World countries and have hindered their fructuous participation in Space activities, that this paper primarily aims to identify with a view to recommending their rectifications and remedial measures.

2. The Boundless Economic and Military Potentials of Space Activities

Utilization and exploitation of Outer Space have proven to be fabulously lucrative and could vest Space Powers with tremendous economic, political and even unrivalled military might. The discovery of the geostationary[1] or geosynchronous orbit or "Clarke Orbit"[2] and of the colossal profit generating potential of the telecommunications *via* satellites have had more repercussions and impacts on the world economy and the people's way of life than the 18th - 19th Century Industrial Revolution. It has triggered off the gold-rush phenomenon toward the commercial exploitation of Outer Space[3] that has entailed numerous practical and legal complications, and made geostationary orbital slot and segments the most precious limited[4] resources that every country craves to possess, because satellite

[1] Orbit where a satellite is always over the same place on earth at all times.

[2] This orbit was named after C.Clarke, the author of 'A Space Odessy', who first described the principles of geosynchronous communications satellites in the 1940s.

[3] Each year from 10-20 communications satellites are launched, valuing at about US$75 million each

[4] Because the geosynchronous orbit is only a ring around the Earth at the equator with a radius of approximately 45,000 kilometers altitude, and a thickness and height of about 100 kilometers or so.

communications could generate billions of dollars annually in sales of products and services.

In the Space and Digitization Age, satellites have become an essential component in our daily life. Without satellites we would not be able to, *inter alia*, thoroughly scan the surface of the Earth and to know about the meteorological and atmospheric conditions[5], we would not have trans-boundary or world TV[6], we would not be able to communicate with each other across the globe, we would not be able to use cellular phones where ever we are and we would not have the wireless Internet[7] and its correlated services, like e-mail, e-learning, or distance education and e-commerce, etc. Innumerous communications satellites provide telecommunications to billions of people[8]. Globally 37 trillion e-mails are sent[9] and there are 899 cable TV channels *via* satellite[10]. In the US alone about 7 million e-mail messages are sent per day and each day 2,000 million telephone communications are made via mobile phones. With the help of the advanced technology of Teledesic Computer Satellites working on a system of broadband, the time it takes for a person to access the Internet from a personal computer will be speeded up and delays in Internet use will be enormously reduced[11]. Facilitation of Internet servicing alone is *per se* already crucially important for the World's economy as a whole, considering that there are 591 million

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[5] With the new technologies such as Doppler radar satellites people are able to prepare themselves for natural disasters.

[6] The fast growing satellite television industry is a boom market, which has proved to be a stable investment.

[7] In the evergrowing computer industry satellites are being used to speed up Internet access and increase the effectiveness of Internet use.

[8] The Indonesian Garuda-1 satellite's ACeS (ASIA Cellular Satellite System) alone has already provided communication services to three billion people in Asia.

[9] www.bbcworld.com/clickonline

[10] BBc World, Oct. 4th , 2004.

[11] TV5, 7.45 p.m., Nov.1st ,2000.

Internet users worldwide.[12]

Space mining, Orbital Solar Power Plants[13] and Space tourism have the potential to generate colosal income, all three of which are being seriously envisaged. Commercial exploitation of the solar-powered satellite electricity generation system (SPS), which would collect solar energy in Outer Space, convert it to electricity and transmit it to Earth *via* microwave beams, which has the potential of generating cheap electricity, reducing our dependency on fossil fuels and other more expensive and environmentally damaging sources of energy on Earth, is one of the promising areas that can be sustainable realized, while pioneer Space tourism industry is already open for business at US$20 million for a one-week stay in Outer Space. The World's first Space tourist was, Dennis Tito, an American tycoon businessman, who flew into Space aboard a Russian "Soyuz" rocket that arrived at the International Space Station on April 30, 2001. The second Space tourist was a South African businessman, Mark Shuttle worth, who took off aboard another Russian "Soyuz" on April 5, 2002. Several Space tourism companies plan to build sub-orbital vehicles and even orbital cities within the next two decades. As these technical-operational goals are achieved, the price per ticket could drop below US$50,000 per passenger, and might eventually reach the range of US$10,000 - US$20,000. With ticket prices well below US$50,000, it is believed that there could be the order of 500,000 space trip passengers/year. A full scale Space tourism industry is truly on the verge of being afoot. And it is estimated that Space tourism could be a US$10 - US$20 billion per year industry by then[14]

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[12] United Nations Commission on Trade and Development, Information and Communication Technology, available at http://globstat.unctad.org/html/eBus_Print.html (Aug. 4, 2004).

[13] Similar Solar Power Plants system operating in airspace is also feasible and is being envisaged by many countries.

[14] www.spacefuture.com

The uncanny accuracy and precision, with which US satellite guided-missiles can hit their remotest targets miles and miles away by using the PPS (Precise Positioning Service) provided by the P-code[15] of the GPS (Global Positioning System)[16], that has given the US military interventions in the Middle East the intimidating code name of the "Shock and Awe" Operation, is the living proof of how lethal the Star Wars type military might deriving from a military use of Outer Space could be. Utilization of "Reconnaissance Satellites" alone can already provide Space Powers with an infinite strategic advantage over Non-Space Powers.

3. *Lacunae* and Flaws in Space Law

Neither the purpose, not the limit of space allocated for this paper permits an exhaustive probe of all flaws and *lacunae* in the prevailing Space Law, therefore, only a few glaring ones could be addressed herein by way of illustrations of some deficiencies and shortcomings in this new branch of international law.

4. Uncertainty of boundary between airspace and Outer Space

The most salient *lacunae* in Space law that, since the dawn of the Space Age when the first man-made satellite, "Sputnik", was

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[15] Precision Code

[16] A Military space system operated by the US Air Force. The space segment of the GPS consists of a constellation of 24 satellites that broadcast precise time signals that aid position-location, navigation and precision-timing. The GPS has also spawned a substantial commercial industry with rapidly growing markets for related services. It is now a worldwide information resource supporting a wide range of civil, scientific and commercial functions, from air traffic control to the Internet. Its Coarse Acquisition Code or C/A Code is designed for non-military use provides the Standard Positioning Service (SPS), which is used by most commercial operations.

successfully launched into Outer Space by the USSR[17], up to now, literatures and articles on this branch of international law seldom fail to address at the outset, are the lack of a hard and fast authoritative *criterion* for the determination of where airspace ends and where Outer Space begins and that *nowhere in the treaties relating to Outer Space is the boundary between the Earth's atmosphere and Outer Space defined*, leaving thus significant legal uncertainties that pose problems for satellite system operators and the governmental regulators of commercial space launches that can involve significant consequences in determining the insurance requirements under the national law and the liability of the governments and commercial launch operators under international and national law.

Quite a few academic attempts have been made to define such a boundary, using terms like atmospheric density or composition of a particular gas in a given volume[18] or the ceiling of conventional aircraft flight, *i.e.* the outer limit of effective aerodynamic lift *used to receive a wide spread support*[19] has nowadays become obsolete on account of the development of modern technology that has elevated the ceiling of conventional aircraft flight to a much higher altitude and given birth to a *hybrid craft that possesses the characteristics of both aircraft and spacecraft* which may, to some extent, be regarded as aircraft with space faring capability like the **X**-15, and a **rocket-plane**, like "Space Ship One"[20]. Lots of other theories, suggestions[21]

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[17] On October 4th, 1957.

[18] Without receiving widespread support due to the uneven nature of the Earth's atmosphere in the stratosphere.

[19] Which is normally at the altitudes of approximately 12-20 miles but not exceeding 25 miles.

[20] Which was successfully launched on June 21st and landed safely. The second launch took place on October 4th and safely landed on California's Mojave dessert in Western U.S.A. (BBC World, Oct. 4th, 2004)

[21] Such as the so-called "Karman" which sets the jurisdiction line at approximately 53 miles.

and figures[22] have been advanced but none has received adequately widespread support of States to acquire the force of a *lex lata* which is applicable *erga omnes* [23].

While the issue remains unresolved in international law, the **lowest altitude of a stable orbiting satellite *criterion*[24]** or **the "perigee" approach**, whereby the upper limit of territorial airspace would be the lowest perigee[25] of an orbiting satellite seems to come closet to the general acceptance by States[26]. It would set a limit at approximately between 50 to 60 miles[27]. Failing any better solution, it has been *de facto* adopted in the prevailing State practice as a makeshift criterion for the determination of where airspace ends and where Outer Space begins[28]. Divergence of views, nonetheless, persists as to the exact altitude from the surface of the earth of such an orbit. Besides, the fact that the X-15 is taken for granted as a **hybrid craft**, which possesses the characteristics of both aircraft and *spacecraft*, speaks for itself that the World community implicitly recognizes that the outer limit of airspace or lowest limit of Outer

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[22] Ranging from 50 miles to 53 miles, 60 miles, 70 miles and even 100 miles above the surface of the earth.

[23] The Australian Space Activities Act of 2002 setting the boundary between Outer Space and airspace at 100 kms does have the force of law, but it is applicable only in Australia.

[24] The horizontal line where an object traveling at 25,000 feet per second loses its aerodynamic lift and centrifugal force takes over.

[25] The **"perigee"** is the point in an elliptical orbit where and when a satellite is closet to the earth's center (as opposed to the **"apogee"**, which is the point in such orbit where and when the satellite is farthest from the center of the earth.).

[26] Cf. UN Secretariat Background papers on "The Highways of Air Space and Outer space Over Asia", A/AC.105/C.2/7/Add.I; Prof.Sompong Sucharitkul, "The benefits of space activities for Asian countries", Proceedings of Regional Meeting of the American Society of International Law on International Problems within the Pacific Rim, p.3.

[27] Which are inclusive of the stratosphere and ionosphere.

[28] Cf. Prof. Jaturon Thirawat, Textbook on Space Law, Thammasat University's Publication, 1997.

Space could be **below the lowest perigee of an orbiting satellite**[29], because the highest altitude up to which the X-15 can ascend is only 47 miles and the ceiling of its flight is qualified as **"sub-orbital"**[30].

In light of this subsisting uncertainty, a germane and cogent compromise solution should perhaps be to include in Outer Space, the overlapped zones between "upper airspace" and "lower Outer Space", referred to by the erudite Professor Sompong Sucharitkul as an intermediate zone call *"neutralia"*, in which event, stratosphere and ionosphere would be inclusive in the Outer Space. Failing any competent international authority to determine and pinpoint with precision the exact altitudes above the Earth of various orbits, like the Geo-stationary orbit[31], the Low Earth Orbit (LEO) and Medium Earth Orbit (MEO)[32], etc., and given the immensity of Outer Space, designations of the altitudes of any orbits can only be approximate, so nobody has made too much fuss about the persisting discrepancy between such figures, because after all, Outer Space is so vast that it would be superfluous for States to make a big deal out of the discrepancy between such figures because after all, Outer Space is so vast that it would be superfluous for states to make a big deal out of the discrepancy of such trivial scales. In any case, if the determination of the exact altitude of such a boundary is an impetus or a center piece factor for the settlement of international disputes, **COPUOS** (The Committee in the Peaceful Uses of Outer Space) will be the competent authority to have the last world on this issue.

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[29] Which is Between 50 to 60 miles above the surface of the earth.

[30] Meaning "below the orbit"

[31] That some say is at 45,000 km. above the surface of the Earth, whereas others say that it is at an altitude of 22,223 miles (35,786 km.) above the Earth.

[32] Especially in the case of elliptical orbits.

5. Definitional shortcomings

Even the definition of "Outer Space" or "Space" is nowhere spelled out *expressis verbis* in any legal instruments[33] and the definition of a spacecraft remains, in several instances, in the gray area, *e.g.*, there has recently been a definitional issue on whether the hybrid aircrafts with a sub-orbital space-faring capability such as the **X-15** and the **"Space Ship one"** which possess the characteristics of both aircraft and spacecraft that could attain the height of up to 47 and 64 miles respectively[34], is an aircraft or spacecraft[35]. The difference in legal consequence ensuing from the determination of their status could be highly significant, since a spacecraft has the freedom of *"innocent transit"* through the airspace of another country in its ascension to and descent from Outer Space, while an aircraft does not have such a freedom. Besides, Space Law often leaves subsisting obscurity and equivocacy in its terminology *e.g.* a *launching State*, which is closely related without being synonymous to an appropriate state, is clearly defined both in the Outer Space Treaty and the Liability Convention as *"either a State that launches or procures the launching of a space object or one from whose territory or facility a Space object is launched"*, while the Outer Space Treaty, without defining it, merely stipulates that an *"appropriate State has the responsibility to undertake the authorization and continuing supervision of the activities of non-governmental entities"*,

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[33] For a lucid definition of "Outer Space" or "Space", Cf. Prof. Sompong Sucharitkul, "The benefits of space activities for Asian countries", Proceedings of Regional Meeting of the American Society of International Law on International Problems within the Pacific Rim, p.1-2.

[34] www.newsnow@voa.com

[35] The stance of Thailand in this respect is that "If **the mission** of a hybrid craft, which possesses the characteristics of both aircraft and spacecraft, is in the outer space and its navigation in the air-space of another State is a mere innocent transit to and from outer space prior to and after its outer space mission, the craft is a spacecraft". (Cf. The reply of Thailand in the UN questionnaire.).

leaving its definition in the realm of academic uncertainty. Some have suggested that the term *"appropriate State"* indicates a State that exercises jurisdiction over the space object and on whose register the space object is recorded under the Registration Convention, but such a definition will leave in a gray area the question as to who has the right to exercise the jurisdiction in the International Space Station.

6. Salient Shortfalls in International Space Law

One of the manifest **flaws** in the existing international Space Law is that it has no comprehensive *corpus of lex lata* dealing with the rapid accumulation of multitudes of demised satellites and tons and tons of Space debris that jeopardize astronauts' life and Man's activities in Outer Space. Despite its blatant need to be urgently and seriously dealt with, this gaping loophole in Space Law has to date been merely acknowledged. Ideas have been proposed but no major plan has actually been put into action. Meanwhile, there has already been an estimated 2200 tons of manmade junk in the environment near the earth. In effect, "The Satellite Situation Report from NASA's Goddard Space Flight Center" of September 1997, counted already almost 25,000 man-made objects: 8681 in orbit, and over 16,000 objects in the state of decay. Russia led the list in decayed objects (with a debris count close to 10,000) and came in a close second (3897) to the United States (4018) for orbiting objects[36]. There are at least 80 satellites that have broken up into smaller fragments. Currently there are over 40,000 pieces of space debris from the explosions of satellites in near-earth orbit, each at least the size of a golf ball and millions of smaller pieces orbiting the Earth. These debris can very easily hit space shuttles, space stations and vital man-made satellites and cause a substantial amount of damage, if,

[36] Not every single satellite is included, since some are too small or too far away from home to be detected.

while orbiting the earth at 31,000 km/per hour, they collide with a space shuttle that is moving at the same speed in the opposite direction. At 17,000 mph, even a small bolt can hit a space shuttle with the impact of a hand grenade. Besides, the dangers of space walks have also increased, as even microscopic pieces of debris can puncture a space suit.

Keeping these alarming figures and statistics in mind, regard must also be had to the fact that some of the multitude of satellite systems in LEO and MEO require over a hundred micro-satellites[37], whose life span normally does not exceed 4-5 years, so such satellite systems will demise and need to be regularly replenished with new sets of satellites every 4-5 years. Space junk and debris have thus become rampant threats to astronauts' life and Man's Space activities that could hamper and compromise so many important future Space projects[38]. Although scientists have officially acknowledged the problem of space debris and have even conceived a method of tracking thier orbit, wher by Space debris can be located by the radio waves launched into Outer Space that bounce off pieces of Space debris and NASA has also visualized a project to build a low-orbit vehicle to sweep away Space debris, given that all such undertakings will involve tremendous expenditure, none of the Space Powers are willing and prepared to bear their costs all alone. As long as there is no viable legal regime for this neglected vital aspect of Space activities, nothing concrete can be expected to come out of such projects. The only gesture that has been made in this area was that the notion

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[37] Teledesic Satellite Network alone already requires the launching of more than 810 satellites and even a smaller satellite network of Motorola requires 72 low-orbit satellites to provide businesses with broad bandwidth communication links around the globe.

[38] The so-called "Space Junkyards or Cemeteries", where a large number of demised geo-stationary satellites are disposed of at the altitudes, which are too high to be utilized for communications purposes are already off limit for all Space activities.

of "Polluters must pay" was floated and alluded to but so far to no avail and without any follow-up.[39]

7. Shortfalls in Space Law, which are Detrimental to Third World Countries

From the perspective of Third World countries, the first and foremost shortcomings in Space Law that warrant the pressings need to be rectified are, *inter alia* the inequity in the allocation of orbital slots and physical access to the geo-stationary orbit; the abusive and unethical exploitation of data on other countries secured *via* remote sensing; and the restriction of opportunity for Third World countries to participate in the formulation or creation of Space Law; etc.[40]

8. Inequitable Allocation of Orbital Slots and Physical Access to Geo-stationary Orbit

When Third World countries vindicated an "equitable sharing" of the geostationary orbital slots[41], what they were driving at was that, since major Space Powers had already made extensive use of the geostationary orbit and are still occupying its quasi-totality, priority should be given to developing countries in the allocation of the **residual** orbital slots, especially those which are squarely under the footprints of the satellites in such orbital segments and are thus the most suitable ones to service. But the original notion of *equitable*

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[39] For more ample details and analysis pertaining to Space Debris, Cf. Eberhart, J. "Tallying Orbital Trash." Science News 138, 29, July 14, 1990 and Goldstein, R.M. and Goldstein, S.J.Jr. "Flux of Millimetric Space Debris." Astron. J. 110, 1392-1396, 1995.

[40] Neither the time constraint nor limitation of allocated space for this present paper permit to exhaustively deal with all of the flaws in the prevailing Space Law, so only some selected issues of prime concerns for 3rd world countries will be discussed herein.

sharing of the Geo-stationary orbit has been dexterously substituted by the *equitable access* concept that can be construed to distort its initial aims and objectives to connote that developed countries are entitled to claim another lion share in the extremely limited residual portion of the already congested Space segments, the majority of which should from the equity standpoint be allocated to Third World countries. To be fair to Third World countries both the "equitable sharing" and "equitable access" principles in real terms should apply to the entire Geo-stationary orbit and not only to its residual portion, otherwise major Space Powers would have a double access to this *res communis humanitators*.

Under the existing Space Law, even the procedure for an acquisition of orbital slot in the Geo-stationary orbit spectrum itself is full of deficiencies and prone to abuse. In effect, according to the prevailing State practice and international norms, a new satellite system operator may gain an international sanctioning of the orbital position that it intends to use only after having fulfilled the three-phase rudimentary procedure established by the ITU (International Telecommunication Union) for such purpose[43] which may be summed up grosso modo as follows:

1. Publication of the "API" (Advance Publication Information) on the desired orbital position of the proposed new satellite network by the ITU in the International Frequency Information **Circular (IFIC)**, which is the 1st phase of the procedure, whereby the **National Space Authority (NSA)** of the State sponsoring the proposed new satellite network is required to file an **API** with the ITU on behalf of the operator of such satellite network in the name of the Administration of that State, thus making that network a satellite

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[41] Which would be in keeping with the res communis humanitators principle.

[42] For more details along this line, Cf. Pamela L. Meridith and George S. Robinson, "Space Law: A Case Study for Practitioner. Implementing a Telecommunication Satellite Business Concept", Martinus Nijhoff Publishers, Dardrecht, 1992.

network of such State.[43]

2. Co-ordination with adjacent satellite operators, which is the 2nd phase known as the **"coordination phase"**, whereby, if other Administrations advice the said **NSA** of the existing and proposed services, that they believe might be affected by their projected satellite networks, that **NSA** is required to file a **Coordination Request ('C' Notice)** with the ITU. The ITU will then publish the **'C' notice** in the **IFIC**, after which the **NSA** will undertake the coordination of that network with other Administrations and satellite operators.[44]

3. If the coordination is successful, the **NSA** will, in the name of the Administration and on behalf of the operator of that network, file a **Notification Request**[45] with the ITU and seek inclusion of the satellite network in the **Master International Frequency Register (MIFR)**[46] and the applicant will request radiocommunication licenses from the ITU to authorize the operation of the service.

At first glance, this summarized procedure may appear to be logical and rational, but when the exact wordings of Articles 11,13 and 15 of the ITU regulations[47] are closely scrutinized, one can

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[43] Hence its status of a satellite networks of the operator's country. (N.B. the rationale wherefore is obviously to impute the liability for any damages caused by the operation of such network to the national country of that network operators.)

[44] Logically, such an obligation should be incumbent on the NSA of the later comers' countries.

[45] A full account of the notification procedure is provided in Articles S9 and S11 of the ITU **Radio Regulations**.

[46] Although, in principle, the ITU is responsible only for the allocation of frequencies and not of the orbital slots, considering that communications satellites would be useless without their associated frequencies, the ITU is, to say the least, tacitly regarded as being also responsible for **the record keeping** of the orbital slots of all communications satellites.

[47] For detailed comments on Art. 11, 12, 13 and 15 of the ITU Regulations, Cf. Milton L. Smith, "International Registration of Satellite Communications", pp.157-162; Pamela L. Meredith and George S. Robinson, pp.186-205.

discern that their intentional vagueness constitutes an immense loophole that could completely defeat their *underlying objective to accommodate the concerns of Third World countries to secure a guarantee for their future access to their legitimate share of the Geo-stationary orbital segments and associated frequencies bands*. For instance, the principle of priority of readiness, which is designed, under the banner of the need to solve the so-called *Paper Satellite* problems, to prevent countries from seeking to acquire orbital slots that exceed their capability to utilize, for a speculative purpose of leasing them to other countries[48], could be abusively construed to rob Non-space Powers of an access to their legitimate share of orbital slots that they intend to use.[49]

Although such an objective seems to be plausible and would have served the purpose to ensure an efficient and economical use of this limited precious natural resource had the terms "priority of readiness" been interpreted to connote that priority should be given to the satellite system operator who is the first to have a concrete project and technical facilities at its disposal to *realistically use the orbital slots in question*, and justice would have been served, provided that the terms *technical facilities* in this context cover the situation where the proposed new satellite system operator has already concluded **irrevocable** procurement, insurance and launch contracts for the satellite in question and do not mean the **actual launching** of the satellite, otherwise the fate of the **"equitable sharing of Space orbit"** principle would be entirely at the mercy of unscru-pulous Space powers, which have all the launch facilities at their disposal and can always outdate a pre-existing launch schedule

[48] Tuvalu, a country in the South West Pacific consisting of a group of nine main islands, the former Ellice Island, with the population of only 8,500 people, contemplates leasing its satellite segments. Tonga, which is a small African country in Southern Mozambique, has also manifestly leased its satellite slots, because it has a number of "Tongasats" satellites that it does not operate by itself.

[49] Prof.Jaturon Thirawat, op. cit., pp. 202-204.

of any Third World country. Unfortunately, there has already been a precedent, where the "priority of readiness" principle was construed by devious lawyers contrarily to the spirit and purposes of the terms to signify that the operator who could **actually launch** its satellite first was readier than the others and should thus be accorded the priority to occupy the orbital slot in contention.

The biggest *lacuna* in this second phase of such procedure for the registration of the frequency assignment and, *in extenso of* the associated orbital position, is that it only imposes an obligation to co-ordinate without setting any timeframe and without requiring *expressis verbis* that the new applicant to use the orbital slot at issue has to wait for the outcome of the co-ordination, nor does it impose an obligation to obtain a consensus on the hierarchy of their respective priorities. Without genuine political will of the country of the late comer satellite system operator to comply in *bona fide* with the procedure do prescribed in accordance with its underlying spirit and objectives, such a requirement is condemned to be a dead letter *ab initio.*

The proposed solution to "Paper Satellites" Problem is also a salient short-coming in Space Law, which is detrimental to the Third World countries. In effect, from the perspective of Third World countries, the inequity in the allocation of orbital slots and physical access to the geo-stationary orbit is closely related to one of the most controversial and thorny issues on the problem of **"satellite over-filing"**, commonly known as the **"Paper Satellites"** problem, which has long been the cause of political bickering between the have and the have not. To solve the problem of **"Paper Satellites"**, a substantial increase of the processing fee was proposed at the Marrakech Conference as a dissuasive measure to deter further accumulation of paper satellites, but it was strongly opposed by Third World countries, on the grounds that such a measure would alienate developing countries and aggravate the social injustice in favor of the rich over the poor, since an insignificant sum of money for developed countries could be a very substantial for developing

countries. A pertinent solution to this problem is rather to improve the existing *sine qua non* for an acquisition of the entitlement to the orbital slots by establishing unequivocal principles that:

Firstly, the allocation of the orbital slots to a country only confers to that country a *preliminary priority* to utilize them before the others. Consequently, as long as that country has no concrete project and readiness to use the orbital slot at issue or even if it has one but its **API** (Advance Publication Information) was just casually published in the **IFIC** (International Frequency Information Circular) without a concrete launch schedule, the proposed satellite system of another country that may affect the service of the projected satellite system of the country, to which that orbital slot is allocated, could initiate a coordination with that preexisting proposed satellite system with a view to adjusting technical parameters of their respective satellite networks to permit the concurrent services of both of them;

Secondly, the orbital slots must be allocated in such a way that there will be no possible interference of frequencies, so that once the operator of the proposed satellite system of the holder of the orbital slot at issue has already **irrevocably** concluded the satellite procurement, launch and insurance contracts, that the satellite system operator should be entitled *ipso jure* to seek the inclusion of his satellite network in the **MIFR (Master International Frequency Register)** forthwith;

Thirdly, there should be 2 regimes for such as "coordination", i.e. (1) In accordance with the "First come, first served" principle under Space Law and State practice, once the operator of a new satellite system has **irrevocably** concluded the satellite procurement, launch and insurance contracts, he should be deemed to be **ready** to utilize that orbital slot and his entitlement to the orbital slot in question should *ipso jure* be **an acquired right**, regardless of the date of the **actual launch** of the satellite, which should not be a prerequisite for an acquisition of such entitlement, because Space Powers who commercialize launch services can always outdate a

launch schedule of any Third World country. Hence, if the coordination of that latecomer satellite network is not successful the satellite network of that other country will have to readjust its own satellite system to ensure that its operation will not adversely affect the services of the satellite system of the holder of the orbital slot in dispute; (2) If, on the other hand, the operator of the satellite network of the country to which the orbital slot in question is allocated has not yet fulfilled the above-mentioned requirement, it can not be regarded as having an impending project and readiness to use that orbital slot, in which case the rules of procedure for a coordination shall apply with an improvement by establishing an appropriate timeframe for the completion of the coordination, during which all satellite systems in contention have to refrain from launching their satellites into that disputed orbital slot.

Fourthly, the ITU should be vested with an enforcement power, not just a record-keeping one, or else compulsory settlement of disputes system will need to be established to ensure the full compliance with international Space Law and effective protection of such entitlement.

9. Military Use of Outer Space

The next substantial shortfall in Space Law is related to the military use of Outer Space. Although under the prevailing Space Law, non-aggressive or defensive military use of Outer Space is not prohibited, in the wake of the widespread use of the so-called "Surveillance or Reconnaissance Satellites" or "Spy Satellites", and the military use of Global Positioning System (GPS) to achieve an incredible accuracy of satellite-guided missiles, which have vested the US army with an unrivaled military might, have triggered off a Star Wars type arms race, that focuses more and more clearly on developing anti-satellite missiles to shoot down the satellites which are perceived as a threat to the security of the country. Such an alarming trend in the current development of Space technology runs

counter-current to the basic principle of Space Law that Outer Space has to be used for peaceful purposes only, and is apt to turn Outer Space into a battle field if a country shoots down a satellite of another country. Hence the bold proposal at the Marrakech Conference to totally prohibit any military use of Outer Space, which under the present international ambiance does not stand the slightest chance to secure adequate international supports to even merely be adopted as a *lex ferenda*, let alone to acquire a *lex lata* status, when even the UN Charter, which is also applicable in Outer Space does not preclude *in toto* the use of force and when a military satellite system like the GPS (Global Positioning System) has spawned a substantial commercial industry with rapidly growing markets for related services. It is now a worldwide information resource supporting a wide range of civil, scientific and commercial functions, from air traffic control to the Internet. Its Coarse Acquisition Code or C/A Code is designed for non-military use and provides the Standard Positioning Service (SPS), which is used by most commercial operations.

The abusive and unethical exploitation of data secured *via* Remote-Sensing is another contentious issue that has provoked a lot of discords and friction between Space Powers and developing countries.

In the Contemporary era, remote sensing plays an important role in our daily life and has largely contributed to enhance the aptitude of the Administration to cope with environment problems, such as deforestation and desertification, as well as drug production and drug trafficking problems. It is also used for crisis and disaster management and provides the possibility of commercialization of raw and processed data deriving there from. It is this latter use of the remote sensing that has given rise to innumerous controversial issues on the unfair and unethical exploitation of data secured *via* remote sensing. For instance, from the stand-point of Third World countries, commercializing the data on a scanned country without sharing with that country the profits accruing there from should be

regarded as an unfair practice, given that commercial exploitation of an individual's photos can not be arbitrarily made without his/her prior consent[50] and without sharing of profits deriving there from at an agreed rate or amount of payment. In the same vein, *proceeds from the sale of the data on a country secured via remote - sensing should be equitably shared with the scanned country*. Such a problem could, perhaps, be overcome by the fact that there are 2 types of remote sensing, i.e. the one operating from outer space and the one from airspace. Unfortunately, that can only partially resolve such a problem, because while States can impose an equitable sharing of profits as a *sine qua non* for the grant of permission to conduct a remote sensing in its airspace, such a solution is inapplicable to the remote sensing operating from Outer Space, which is not under the jurisdiction of the subjacent State. Consequently, unless an appropriate legal regime for this type of situation is established, this part of the problem will remain without viable solution.

More importantly, the disclosure or dissemination let alone commercial exploitation of **data which are vitally important for the security of a country**, thus obtained, such as the locations, sizes, potential and details of the arsenal of military bases, which are normally treated by every country as classified military secrets, should imperatively be made subject to the prior authorization or consent of the scanned country, otherwise Space Law would be outrageously iniquitous and no better than the "Might is Right" law of the jungle, whereby Third World countries are denied even the right to their security and self-preservation just to allow a handful of unscrupulous people of Big Powers to prosper at the expenses and peril of weaker nations. **Furthermore**, data on a country acquired *via* remote sensing can render **mapping** incredibly accurate when coupled with hi-technology like the high-resolution photogrammetry that makes it possible to establish a realistic **bass-relief map of a country** that can

[50] Except where the individual in question is a public figure.

be used for strategic purposes and could for that reason be detrimental to the security of the scanned country. Hence the need for this type of map to also be made subject to the same regime of non-dissemination without prior consent of that country. Only a non bass-relief map delimiting the boundary of a country should be allowed to be freely disseminated and commercialized

10. Conclusion

A large majority of the above-mentioned flaws and inequity in the international Space Law emanate from the lack of international authority vested with enforcement power and entrusted with a policing function to ensure a full compliance with the rules and norms under the existing Space Law. Such an International Space Authority can resolve many of the conflicts and bickering between Space Powers and Third World countries pertaining to a utilization or exploitation of Outer Space, especially the respect of the acquired rights of pre-existing satellite systems. Failing such international authority even in the case where satellites of Third World countries are duly registered in the Master International Frequency Register and already placed in orbits, any unscrupulous Space Powers can still oppress Third World countries by launching their satellites into the orbital slots that will inevitably cause an interface of frequencies beyond acceptable levels, compelling pre-existing operators of Third World countries to relocate their satellites or reduce their transmitting power.

Another point of contention between Third World countries and major Space Powers that should be alluded to in conclusion is that the prevailing Space Law and State practice are not quite in keeping with the democratization trend in the on-going development of international law regarding the restriction of opportunity for Third World countries to directly participate in the elaboration or creation of this branch of international law. The fact that the membership of COPUOS, whose legal sub-committee plays a

primordial role in the elaboration of the international Space Law is reserved for just a handful of countries, only a restricted number of which are from the Third World, makes it practically impossible for developing countries to meaningfully contribute to the orientation of Space Law in the direction that would ensure an equity in real terms for Third World countries. An inclusion of more Third World countries is therefore, to say the least, desirable.

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