



Atma Jaya Studies on
Aviation, Outer Space and Cyber Laws

SPACE LAW DEVELOPMENT IN RETRO AND PROSPECT

(Collections of Thoughts, Ideas and Contributions)



Prof. Dr. Ida Bagus Rahmadi Supancana

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PREFACE

Within more than 6 decades after the first human venture into outer space, space science and technology have made substantial progress both in terms of its inventions and applications to facilitate human needs. In line with such development, Space Law has also made significant progress. Five (5) international space treaties have been formulated and taken into force, while several UNGA resolutions on principles governing certain activities in outer space have been agreed upon.

One of the characteristics of Space Law, it is responsive and anticipative to the present and future development. There are certain legal issues relevant to space activities that should be studied and examined as a way to provide solutions. Some legal issues which need further consideration cover, among others: space contribution to disaster management; access of developing countries to space resources; developing countries contribution to the legal formulation of future space law; commercialization of space activities; participation of non-state legal actors in space activities; interpretation and implementation of the international treaties and legal principles governing space activities; spacecraft financing; national space policies and institutions; the space law development in Indonesia, the formulation and implementation of national space act; the need for fair and equitable access to orbit-spectrum resources; long terms sustainability of space activities and space security and its contributions to human security; and ASEAN space programs.

On the above legal issues, the writer had the opportunity to provide some thoughts, ideas and contributions both to solve the existing legal issues as well as to shape the development of future space law. This book is a reflection of the writer's journey for more than four (4) decades in dealing with various issues on space law. It is expected that the development of space law would, not only accommodating the national interest, but also the legitimate rights of other countries as well as the international community and the betterment of humanity.

Jakarta, September 2023

Ida Bagus Rahmadi Supancana

TABLE OF CONTENT

Preface.....	v
Table of Content	vii
1. Space Contribution to Disaster Management: Legal Framework (Paper presented at International Space Conference, Chiang Mai, Thailand, 1-4 August 2006)	1
2. Guaranteeing Access of Developing Countries to Outer Space (Discussion Paper presented at IISL Space Law Conference, Beijing April 2004)	21
3. Interpretation and Implementation of International Space Treaties and Its Implications to the Formulation of National Space Legislation (An Indonesian Experience) (Paper presented at Second National Conference on Space Law, Kuala Lumpur, Malaysia, April 2004)	41
4. The Commercialization of Space Activities: Challenges and Opportunities for Developing Countries (Presented at United Nations/Indonesia Regional Conference on Space Science and Technology for Sustainable Development, Bandung, 1993).....	61

5.	Preliminary Draft of Space Protocol: Commercial Opportunities and Challenges for Developing Countries (Satellite Newsletter 2004)	75
6.	Commercial Utilization of Outer Space and Its Legal Formulation Developing Countries Perspectives (Proceedings of the Thirty-Fourth Colloquium on The Law of Outer Space, International Astronautical Federation”, Montreal, Canada, 1991)	81
7.	The Contribution of Developing Countries to the Legal Formulation of Future Space Law (The Contribution for the Book: Space Law Views of the Future, Kluwer, the Netherlands, 1988)	97
8.	Indonesian Space Policies and Institutions (Paper presented at the UN Korea Workshop on Space Law, Daejeon, Korea, 3 November 2003)	113
9.	The Development of Space Law in Indonesia (Indonesian Law Journal, Vol. 1 No. 1, September 2006)	127
10.	International Disaster Response Law, Rules and Principles (IDRL) Program of the International Federation of Red Cross and Red Crescent Societies (IFRC) (Paper presented at Conference on Space Law and Space Applications for Disaster Management in the Asia Pacific Region, Bangkok, Thailand, 22 November 2007)	141
11.	Progressive Development of Outer Space Law: How It Affects the Formulation of National Space Legislation (Some Lesson Learned from The Experience of Indonesia in Formulating the Law Number 21 of 2013 Concerning Space Activities) (Journal of Air and Space Law Vol. 40 No. 1 Year 2015, Kluwer Law International BV, The Netherlands)	155

12. The Legal Challenges of Implementing National Space Legislation: The Case of Indonesia (German Journal of Air and Space Law, Vol. 65 No 2 Year 2016)	169
13. Ensuring Equitable Access for Developing Countries in The Utilization of Earth-Orbits Spectrum Resources (Lecture at APSCO Training, held at Harbin Institute of Technology, People Republic of China, July 8 th of 2017)	187
14. Indonesian Space Policy, Regulations and Programs: Past Achievements and Future Prospects (This article is published as a chapter in the book: ASEAN Space Program, History and Way Forward, et al, Springer Nature Singapore Pte, Ltd. 2021)	205
15. Legal And Regulatory Framework of Long-Term Sustainability of Outer Space Activities (LTSOSA), Space Security and Its Contribution towards Human Security (This article is published in International Journal of Research in Business and Social Science, Vol 11 No. 1 Year, February 2022, Page 358-363. ISSN: 2147-4478)	237

SPACE CONTRIBUTION TO DISASTER MANAGEMENT: LEGAL FRAMEWORK^{*}

I. GENERAL

A. Background

In the period of less than a decade (from November 2000 to May 2005) we could observe of more than 66 major disasters all over the world, from earth quake and Tsunami in Southern Asia;¹ Mount Etna Volcano Eruptions in Italy;² Floods in Argentina;³ Forest fires in British Columbia (Canada);⁴ Hurricane in Cook Island;⁵ Typhoon in Philippines;⁶ Floods and Landslides in Haiti and Dominican Republic;⁷ Landslides in North Ossetia (Russia);⁸ to the Oil Spill and Marine Pollution in Galapagos;⁹ and even Train Explosion in Ryongchon, North Korea.¹⁰ From 1994 to 2003 there were more than 300 natural disasters on average every year, impacting more than 100

¹ * Paper presented at International Space Conference, Chiang Mai, Thailand, 1-4 August 2006.
26 December 2004

² 26 July 2001

³ 30 April 2003

⁴ 7 August 2003

⁵ 5 February 2005

⁶ 1 December 2004

⁷ 26 May 2004

⁸ 27 September 2002

⁹ 26 January 2001

¹⁰ 23 April 2004

countries, killing over 50,000 people, affecting nearly 260 million people and causing economic damage to US\$ 55 billion each year.¹¹ The economic cost associated with natural disasters has increased 14-fold since the 1950's.¹²

In a way to anticipate and reduce the risk from future major disasters, there is a need to develop a better response and disaster management both at the domestic, national, regional and global level through effective coordination mechanism. All resources and parties must be involved in such efforts in the name of humanity and sustainable development. Those resources will include not only fund, organization, but also technology. In this case space-technology could play important role.

B. Purpose and Objectives

1. The purpose of this paper is to explore ways and means to formulate and implement effective legal framework to support disaster management efforts by using and implementing space technology and organizations;
2. While the objectives would be to contribute to humanity through better approach in disaster management

II. NATURAL DISASTER, DISASTER MANAGEMENT AND SPACE TECHNOLOGY CONTRIBUTION TO DISASTER MANAGEMENT

A. Indonesian's Experience

Indonesia is a prone natural disaster country. Within the last two years Indonesia has been struck by several major disasters, such as: Tsunami in Aceh and in North Sumatra by the end of 2004; Earth Quake in Yogyakarta in May 2006; Mount Merapi Eruption in Yogyakarta and Central Java in May - June 2006; Floods and Mudslide in West Java, East Java and South Sulawesi in 2005 and 2006. The Tsunami

¹¹ UNGA Doc A/AC.105/C.1/L.285

¹² Ibid.

has taken the lives of more than 200.000 people while Earth Quake took the lives of more than 6000 people. Most of the infrastructure in the affected area is totally destroyed. It needs quite sometime in the rehabilitation and reconstruction process which will absorb huge number of sources. Not mentioning the efforts to heal/cure the people who suffer from such disasters.

In Indonesia, the National Disaster and Refugee Coordination Board (Bakornas PBP) is in charge as coordination body for national disaster at national level,¹³ while at Provincial level is Satkorlak (the coordinating task forces at the provincial level),¹⁴ and at Satlak is Task Forces at Regency/City level.¹⁵

Bakornas PBP's main tasks are:

- Helping the President plan for natural disaster;
- Handling natural disasters-establishing early warning systems, dealing with emergency situations and disaster rehabilitation through to the recovery phase;
- Creating policy and guidelines;
- Coordinating other aid groups;
- Coordinating provincial and regional task forces;
- Providing humanitarian aid, transportation and medical assistance, information and security.

Bakornas PBP's structure consists of Health Ministry, Public Works Ministry, Social Welfares Ministry, the Arm Forces (TNI), Red Cross, Transportation Ministry, Mining and Energy Ministry and Information Ministry. Similar structure applies to both at Satkorlak (provincial level) and Satlak (regency/city level).

During the operation and relief efforts in the above natural disasters, the international communities, both countries, inter-governmental organization and non-governmental organizations, have shown their

¹³ Bakornas PBP is chaired by Vice President.

¹⁴ Satkorlak is chaired by Governor of the Province.

¹⁵ Satlak is chaired by Regent or Mayor.

sympathy and empathy by providing aids in almost every aspect. The contributions from the international community are ranging from: search and recovery and clean-up operation, providing foods and the daily needs, medical aids, to rehabilitation and reconstruction process. An international summit for coordinating the relief efforts and international aids were also held in Jakarta just a month after the Tsunami. Participation and contribution from the international community have shown that “humanity” is the main consideration for providing aid relief without considering the distinction of race, religion, nationalities and even ideologies.

During relief and rehabilitation efforts of the Tsunami in Aceh; Volcanic Eruption in Yogyakarta; Earth Quake in Nabire and Yogyakarta; Flood and Mudslide in West Java and East Java, some difficulties were faced. They criticized Bakornas PBP for being too bureaucratic which in some ways hampering the speedy process in disaster relief and operation to help disaster victims. They claim that Bakornas PBP and its subsystems were no longer effective because they were unprofessional and too bureaucratic and therefore need to be reformed.¹⁶ Reform would mean replacing untrained bureaucrat with paid professionals, who were given the authority to coordinate with government agencies. The European Union’s team and Saudi Arabian rescue workers have also noted coordination difficulties in aid and relief efforts.¹⁷

As disaster requires an immediate response, not bureaucratic, formal time consuming procedures, there is a need for approach to disaster relief efforts, so called, organizational network. In the context of a disaster, a network is a form of governance that refers to multi organizational arrangements for solving problems that cannot be fixed or fixed easily, by single organizations. In network, coordination is important to minimize redundant task, incoherence, incompatibilities, tensions and conflicts among organizations.¹⁸

¹⁶ See Ridwan Max Sidjabat, “Disaster Agency’s Role in Spotlight”, Jakarta Post, 1 June 2006.

¹⁷ See, Ibid.

¹⁸ See, Adi Kusuma, “Role of Bureaucracy in Disaster Relief”, Jakarta Post, 8 June 2006.

By learning from two (major) disasters which have struck the country within 2 (two) years, the government needs to open up for resources from various organizations, be they non-profit, for profit, civilian and military. Yet, the government is not without an essential role to play. The government needs to be the “center” of operation, not necessary the resources. It needs to coordinate the relief efforts to go on.

B. **The Tsunami Experience in the Region**

The Tsunami disaster in December of 2004 not only hit Indonesia but also, it’s neighboring countries in the region, such as: India; Thailand; Malaysia, Madagascar, Ceylon, etc. International sympathy, empathy, aids and attention have been given to the Tsunami considering the magnitude of such disaster. The contribution of the international community is not only confined to countries, but also involve international organizations (both governmental and non-governmental), and even individuals.

The main important issue during the relief operation, rehabilitation and reconstruction of the affected area caused by Tsunami is coordination issue. None of the affected countries in the region have experiences in handling such scale of disaster. On one parts, none of these countries have any reference how to deal with coordination issues which could satisfy the interest of all relevant parties such as victims, donors, volunteers, local government, etc. On the other part, there was the need for speed response for disaster mitigation and risk reduction.

The affected countries and international community have learned a lot from the Tsunami how to cope with similar scale of disaster which would possibly happen in the future through improvement of disaster management. It should be understood that in the broadest sense, disaster management shall cover activities, including but not limited to: prevention,¹⁹ preparedness,²⁰ early warning,²¹ emergency

¹⁹ Prevention is any efforts which are taken to prevent disaster or risk that may be arisen from it by eliminating the danger through certain preparation measures, such as: regulatory framework, setting up procedures and socialization activities by learning and training.

²⁰ Preparedness is the condition of which certain anticipation has been made to face the disaster by organizing and implementing effective and efficient measures.

²¹ Early warning is any efforts to provide warning signals that a disaster might possibly occur. Such

response, relief, evacuation, mitigation, recovery, rehabilitation and reconstruction.

C. **Contribution of Space Technology**

Space-based technologies, such as meteorological and Earth observation satellites, communication satellites and satellite-based positioning technologies offer the potential for improved risk reduction, accurate prediction, early warning and monitoring of the impact of disasters for enhanced relief and rehabilitation operations, use of which would lead to major reductions in loss of life and property. Here are some of the details:

1. Earth observation satellite has demonstrated their utility in providing data for a wide range of applications in disaster management;²²
2. Meteorological satellite can monitor weather patterns, detect and track storms, and monitor frost and floods;²³
3. Global Navigation Satellite System (GNSS). Such the Global Positioning System (GPS) of the USA and GLONASS of the Russian Federation provide accurate position, velocity and time information that is readily accessible at ground level to anyone with a receiver;²⁴

early warning should be accessible, immediate, coherent and official.

²² Pre-disaster uses include risk analysis and mapping; disaster warning, such as cyclone tracking, drought monitoring, the extent of damage due to volcanic eruptions; and disaster assessment, including flood monitoring and assessment, estimation of crops and forestry damages, and monitoring of land use/change in the aftermath of disasters. Remotely sensed data also provide a historical database from which hazard maps can be compiled, indicating which area are potentially vulnerable. Information from satellites is often combined with other relevant data in geographic information system (GIS) in order to carry out risk analysis and assessment. GIS can be used to model various hazard and risk scenarios for planning the future development of an area. See Ibid, paragraph 9.

²³ Derived products are produced routinely several times per day; many of them focused on particular hazard events. Tracking sequences of tropical cyclone images from geostationary satellites as well as storm intensities and atmospheric winds derived from these images provides vital information for forecasting landfall contributing to saving lives. Additionally, the integration of experimental products, such as ocean surface winds from scatterometer instruments and moisture or rainfall from microwave instruments, has improved these forecasts.

²⁴ The reduction in size and cost of receivers is contributing to widening the number of users that are now using such technological solutions to collect data to support risk reduction and emergency

4. Communication satellites enable the setting up of emergency communication channels and increasingly being used by all those responding to emergency.²⁵

III. LEGAL FRAMEWORK FOR DISASTER MANAGEMENT

A. Past and Current Initiatives

1. World Conference on Disaster Reduction, Kobe, Japan, 18-22 January 2005

The conference recognized the contribution of space technology to disaster reduction and emphasized the need to incorporate space-based services routinely to support risk reduction. A list of commitments is set out in the Hyogo Framework of action 2005-2015 which will contribute to substantially reduce the losses in lives and social, economic and environmental assets of communities and countries.²⁶ Some other documents were resulted, such as: Review of the Yokohama Strategy and Plan-of Action for a safer World; The Hyogo Declaration; and Common Statement of the Special Session on the Indian Ocean Disaster; Risk Reduction for a Safer Future.²⁷

2. UN/Algeria/European Space Agency International Seminar on the Use of Space Technology for Disaster Management: Prevention and Management of Natural Disaster, Algiers 22-26 May 2005.

During the seminar, the key issues on disaster management and the contribution of space technology were presented and discussed, covering issues, such as:²⁸

response activities.

²⁵ Additionally, there is the need to receive information from and send information to the various emergency response teams working in the field, including large data files such as maps and satellite images.

²⁶ UNGA, "Draft study on the possibility of creating an international entity to provide for coordination and means realistically optimizing the effectiveness of space-based services for use in disaster management"; 5 October 2005.

²⁷ These documents can be found on the UNISDR website: <http://www.unisdr.org/wcdr>.

²⁸ See UNGA Doc No A/AC.105/852 of 28 September 2005. For further detail on the presentation during the seminar, visit the website www.asal-dz.org.

- a. How space technology could best be applied to disaster management in the Northern Africa Region;
- b. An overview of current best practice in the use of space technology for disaster management;
- c. International cooperation in disaster management;
- d. The case study of Ceylon experienced in relation to the Tsunami in the Indian Ocean in 2004.

Some important recommendations from the seminar are among others;²⁹

- a. Identification of the need for a regional task force that would bring together civil protection and space technology institutions;
 - b. The need for capacity building at the national level for the integration of space technology into prevention and management of national disasters, in particular through training based on existing regional and national structures and specialized centers;
 - c. The proposal for the implementation of a regional task force for the North African Region for coordination between civil protection agencies and space technology institutions.
3. Munich International Workshop on Disaster Management of October 2004

The workshop organized by OOSA discussed a global strategy that would contribute to helping developing countries have access to and be able to use space technology for disaster management. The participants recognized that space-based technologies such as Earth observation satellite, communications satellite, meteorological satellites and global navigation satellite systems, play an important role in risk reduction and disaster management. A strategy was put forward as “The Munich Vision: A Global Strategy for Improved Risk Reduction and Disaster Management

²⁹ See Ibid, paragraph 34-36.

Using Space Technologies”. A number of recommendations were also put forward, namely:³⁰

- a. Capacity development and knowledge building;
 - b. Data access, data availability and information extraction;
 - c. Enhancing awareness;
 - d. National, regional and global coordination.
4. UN Regional Workshop on the Use of Space Technology for Disaster Management for Western Asia, Riyadh, 2-6 October 2004

The presentations at the seminar covered the following issues:³¹

- a. The application of space technology in the management of a wide variety of disasters and the current status of the use of space technology in disaster management;
- b. The existing constraints in applying space technology;
- c. Case studies on the use of space technology for various forms of disaster management;
- d. The need of the end-user, and examples on the use of space technology in various phase of disaster management the disaster itself, response, recovery, reconstruction, mitigation and preparedness;
- e. Examples of integrated solutions for space technology and disaster management;
- f. Innovative developments and initiatives.

Some important recommendations from the workshop are:³²

- a. Capacity building and knowledge-building;
- b. Networking and coordination mechanisms;
- c. Data availability and data access;

³⁰ UNGA, “Draft study on the possibility of creating international entity to provide for coordination and the means of realistically optimizing the effectiveness of space-based services for use in disaster management”, 5 October 2005, paragraph 41.

³¹ See UNGA Doc No A/AC.105/836 of 13 December 2004, paragraph 13-20. For further detail of the presentations, visit the website www.oosa.unvienna.org/SAP/stdm.

³² Ibid, paragraph 26-42.

- d. Space technology infrastructure;
 - e. Awareness rising;
 - f. A common regional plan of action and commitments;
 - g. Demonstrating the use of space technology.
5. World Conference on Natural Disaster Reduction, Yokohama, 23-27 May 1994

The important results of this conference are: the Yokohama Message and Yokohama Strategy and Plan of Action. The Yokohama Message affirms that:³³

- a. The impact of natural disaster in terms of human and economic losses has risen in recent years, and society in general has become more vulnerable³⁴ to natural disaster;
- b. Disaster prevention, mitigation, preparedness and relief are four elements which contribute to and gain from the implementation of sustainable development policies;
- c. Disaster prevention, mitigation and preparedness are better than disaster response in achieving the goals and objectives of the decade;
- d. The world is increasingly interdependent. All countries shall act in a new spirit of partnership to build a safer world based on common interests and shared responsibility to save human lives, since natural disaster do not respect borders;
- e. The information, knowledge and some of the technology necessary to reduce the effect of natural disasters can be available in many cases at low cost and should be applied;
- f. Community involvement and their active participation should be encouraged in order to gain greater insight into the individual and collective perception of development and risk, and to have a clear understanding of the cultural and

³³ See OOSA Doc, "Space Technology and Disaster Management", 2005, page 5-6.

³⁴ Ibid, page 7-15.

organizational characteristics of each society as well as of its behaviors and interactions.

The Yokohama Strategy and Plan of Action contain:

- a. Principles; basis for the strategy; assessment of the status of disaster reduction midway into the decade; and strategy for the year 2000 and beyond;
- b. Plan of action; activities at regional and sub-regional level; activities at the international level, in particular through bilateral arrangements and multilateral cooperation;
- c. Follow-up of action.

B. Existing International Institutions Dealing with Disaster Management

1. UNOOSA

UNOOSA has played a very important role in coordinating and facilitating activities in the framework of Space Technology and Disaster Management. The main goal of this initiative is that in order for developing countries to be able to incorporate the use of space-based technology as their solutions to deal with natural disaster, there is a need to increase awareness, build national capacity and develop solutions that are customized and appropriate to the needs of developing countries. To achieve the above goal UNOOSA has facilitated a series of regional workshops from 2000 to 2005 in order to better use space technology for disaster management, and also to strengthen cooperation of the task force at the regional level.

2. UNCOPUOS

As a political forum where space issues are discussed through its Scientific and Technical Sub-Committee, Legal Sub-Committee and Parent Committee, UNCOPUOS have played very important role, including in the efforts to utilize space science

and technology as a way to deal with natural and technological disaster for the purpose of disaster mitigation, risk reduction, disaster management, etc.

3. The International Telecommunication Union (ITU)
ITU Contribution to disaster management includes:³⁵
 - a. Involved in the drafting of Tampere Convention in 1998;
 - b. The World Telecommunication Development Conference adopted Resolution No. 34 (telecommunication resources in the service of humanitarian assistance) and Recommendation 12 (consideration of disaster telecommunication needs in telecommunication development activities) in 2002;
 - c. ITU Plenipotentiary Conference adopted Resolution 36 (telecommunication in the service of humanitarian assistance) in 2002;
 - d. World Radio-communication Conference (WRC) adopted Resolution no 646 (definition of reserved spectrum for emergency communication) in 2003.

Some of the works of ITU Sectors have also been dedicated to disaster management, for example:

- a. ITU-D (the Telecommunication Development Sector) considers disaster as parts of its mandate. The 4 (four) main principles of ITU-D in dealing with disaster management are: multi hazard; multi technology; multi phased; and multi shareholder.³⁶ During the Tsunami ITU-D established a Tsunami emergency team that worked with the effected countries to assess their immediate needs;³⁷
- b. ITU-R (the Radio Communication Sector) dealing with aspects of radio-communication services associated with

³⁵ See 43rd session of Scientific and Technical Sub Committee of UNCOPUOS 2006. UN Doc A/AC.105/C.1/2006/CRp.13 on "Activities of Specialized Agencies in the UN System on the Subject of Space-Based-System Disaster Management Support, paragraph 1-3.

³⁶ Ibid, paragraph 4-9

³⁷ Ibid, paragraph 21

disaster include, inter-alia, disaster prediction, detection, alerting and disaster relief;³⁸

- c. ITU-T (the Telecommunication Standardization Sector). Though ITU-T is not involved in emergency and disaster relief operation, per se, however it develops recommendation that are fundamental for the implementation of interoperable systems and telecommunication facilities that will allow relief workers to smoothly deploy telecommunication equipment.³⁹

Since January 2005, ITU has participated in a series of high-level international meetings seeking to enhance preparedness through early warning system, response, relief and reconstruction.⁴⁰

4. ESCAP (The UN Economic and Social Commission for Asia and the Pacific) and RESAP (The Regional Space Application Program for Sustainable Development)

ESCAP and RESAP place an emphasis on increased contribution of space technology for sustainable development and improved quality of life in Asia and the Pacific, and disaster management has been one of its priorities.

Space applications for disaster management are a topic addressed by ESCAP using both sectoral and multi sectoral approaches. In addition to the major contributory fields of earth-observations and satellite communications, the issue of disaster management is also addressed through the application of space-based distance education, tele-health and the empowerment of community through community e-centers.

Since 2002, a series of activities have been organized by the ESCAP secretariat on the use of space technology for disaster management under RESAP. Those activities are parts of the goal of ESCAP to help prepare the region for pursuing the

³⁸ Ibid, paragraph 11

³⁹ Ibid, paragraph 16

⁴⁰ Ibid, paragraph 23

development of improved regional cooperative mechanism for disaster management, but not limiting to space technology. Some partnership cooperation with other organizations such as ITU and Asia-Pacific Satellite Communication Council (APSCC) has been planned to organize meetings on disaster management. ESCAP also promoting and supporting the implementation of the Tampere Convention for the development of an affordable/sustainable implementation of deployable satellite-communication enriched disaster response capabilities.

As part of the ESCAP regional strategy on disaster reduction, RESAP intends to place more emphasis on disaster management and on developing national and regional capacity in the coming years in order to:

- a. Assess hazard risk;
- b. Promote preparedness and risk reduction;
- c. Establish multi-task national/regional warning and response system;
- d. Facilitate community-based disaster reduction; and
- e. Develop linkages to other UN and regional initiatives related to disaster management using space technology.

ESCAP also support the Scientific and Technical Sub-Committee's works on the establishment of a global system to manage natural disaster mitigation, relief and prevention as recommended in Vienna Declaration.

C. International Legal Instruments

1. Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters

The Charter, known as International Charter "Space and Major Disaster" was initiated by the European Space Agency (ESA) and the France Space Agencies (CNES) which was declared formally operational on 1st November 2000. Some major space agencies

from space faring nations such as: The National Oceanic and Atmospheric Administration (NOAA), Canadian Space Agency (CSA), the Indian Space Research Organization (ISRO), the Japan Agency for Aerospace Exploration Agency (JAXA) have also become members.

The Charter consist of 6 articles, namely: definitions; purpose of the Charter; overall organization of cooperation; contributions by the parties; associated bodies; accession; entry into force, expiry and withdrawal; and implementation.

The purpose of the Charter is to promote cooperation between space agencies and space system operators in the use of space facilities as a contribution to the management of crisis arising from natural or technological disasters. While the objectives are: to provide data as a basis for critical information for the anticipation and management of potential crisis; and to participate in the organization of emergency assistance or reconstruction and subsequent operations.⁴¹

A board on which each party is represented and executive Secretariat will be in charge of administrative, operational and technical coordination for implementation of the Charter. A mechanism of cooperation and coordination among Beneficiary Bodies,⁴² Associated Bodies⁴³ and Cooperating Bodies⁴⁴ is also served under this Charter.⁴⁵

The contribution of the parties includes, among others:⁴⁶

- a. Space facilities available for use;

⁴¹ See, Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in The Event of Natural or Technological Disasters of 2000, article II.

⁴² The authorities and bodies concerned in a country affected by a disaster.

⁴³ An institution or service responsible for rescue and civil protection, defense and security under the authority of a State whose jurisdiction covers an agency or operator that is a party to the Charter, or of a Member State of ESA or of an international organization that is a party to the Charter (see the Charter, op.cit Article V para 5.2).

⁴⁴ The European Union, The UN Bureau for the Coordination of Humanitarian Affairs and other recognized national or international organizations, whether governmental or non-governmental.

⁴⁵ See, Ibid, article III.

⁴⁶ For further detail, read Article III of the Charter.

- b. Analyze recent crises for which space facilities could have provided or did provide effective assistance to the authorities and rescue services concerned;
 - c. Identifying of a crisis situation for which it requires intervention of the parties;
 - d. Planning of space facility availability in the event of a crisis;
 - e. Supply associated bodies and, where appropriate, beneficiary bodies with data, and if necessary associated information and services, gathered by the space facilities.
2. The Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations
- The Convention that entered into force on 8 January 2005 following the ratification by 30 countries, will contribute to the greater availability of telecommunication equipment for disaster mitigation and relief. The Tampere Convention is a legally binding international instrument aimed at helping relief workers brings telecommunications equipment across borders during and after an emergency, with a minimum difficulty.

D. The Possibility of Establishing Coordinating Body on International Space Cooperation and Disaster Management

As a part of implementing the recommendation of the Third United Nations Conference on the Exploration and Use of Outer Space (UNIISPACE III)⁴⁷ an action team (known as Action Team 7) was established by focusing on “studying and recommending the implementation of integrated operational global system, especially through international cooperation, to manage natural disaster mitigation, relief and prevention efforts through earth observation, communication and other space-related services, making maximum

⁴⁷ UNIISPACE III RECOMMENDATION (1999)

“Recommending the implementation of an integrated operational global system ... to manage natural disaster mitigation ... through earth observation, communications and other space related services, making maximum use of existing capabilities and filling gaps in worldwide coverage.”

use of existing capabilities and filling gaps in worldwide coverage”.⁴⁸ Through a comprehensive process of consultation, surveys, analysis of gaps and needs, the team submitted its finding and recommendations to the forty-first session of the Scientific and Technical Sub Committee of the UNCOPUOS.⁴⁹ One of its recommendations is to implement an international space coordination body for disaster management, nominally identified as the “Disaster Management International Space Coordination Organization (DMISCO)”.⁵⁰ Such a body would have the mandate to provide the necessary means to optimize the access to and use of current and future space-based services for disaster management.

The recommendation on establishment of DMISCO was further submitted to the General Assembly at its 59th session in 2004. During the session, General Assembly agreed “that a study should be conducted on the possibility of creating an international entity to provide for coordination and the means of realistically optimizing the effectiveness of space-based services for use in disaster management and that the study should be prepared by an ad-hoc expert group, with expert to be provided by interested Member States and relevant international organizations”. The ad hoc Expert Group agreed that the international space coordination body recommended by Action Team 7, DMISCO, would provide such a coordinating mechanism.⁵¹ The key aspects that the expert emphasized was that DMISCO has to be identified as a platform for fostering alliances of international initiatives and mechanisms (space technology and disaster management). The initial emphasis of its activities and services should lie in the coordination and interaction with relevant national authorities, scientific institutions, organizations implementing and/or providing space-based solutions, humanitarian, environmental and civil protection actors, and the space

⁴⁸ See UNGA, “Draft Study on the Possibility of Creating an International Entity to Provide for Coordination and the Means of Realistically Optimizing the Effectiveness of Space-Based Services for use in Disaster Management”, 5 October 2005, paragraph 1.

⁴⁹ In 2004

⁵⁰ Op.cit, paragraph 2

⁵¹ Ibid, paragraph 42

community.⁵² The experts also further defined the key informational, coordination and operational function of the proposed entity.⁵³ Some possible benefit from the implementation of the Coordination Entity would cover the following area: capacity development and knowledge building; data access, data availability and information extraction; and enhancing awareness⁵⁴. Other relevant aspects to be considered toward the establishment of DMISCO would include: organizational scope and nature; relationship with existing and planned international organizations and initiatives; mobilization of resources (fund); and implementation plan.

During the 43rd session of the Scientific and Technical Subcommittee in 2006, the Group of expert presented the study on the possibility of Creating a Disaster Management International Space Coordination Entity⁵⁵. The focus of DMISCO would be:⁵⁶

1. “One Stop Shop” and a platform for fostering alliances;
2. It should be user driven;
3. Bridge the gap between the disaster management organizations, creating a forum where both can meet;
4. Contribute to making optimal use of the existing available resources;
5. It should interact with other relevant initiatives and organizations;
6. Focus on existing gaps that are limiting the use of space technology;
7. It should have informational, coordination and operation function.

⁵² Ibid, paragraph 45.

⁵³ Ibid, paragraph 46-48.

⁵⁴ See Ibid, paragraph 50-61.

⁵⁵ See UN Doc A/AC.105/C.1/L.285 concerning “Study on the possibility of creating an international entity to provide for coordination and the means of realistically optimizing the effectiveness of space-based services for use in disaster management”.

⁵⁶ Ibid.

Considering the importance of having a global coordinating body which would coordinate the efforts of international community in all stages of disaster management, the idea of establishing DMISCO should be welcomed. The establishment of DMISCO can be initiated with implementation of certain UN Program in order to convince relevant stakeholders within the international community on the importance of such organization in the name of humanity.

IV. CONCLUDING REMARKS

- A. The lesson that we should learn from the impact of the past disasters, both natural disasters and technology disasters is the need to have a better management in dealing with the future disasters both in prevention, preparedness, early warning, emergency response, relief, evacuation, mitigation, recovery, reconstruction and rehabilitation processes.
- B. The past experiences have shown that participation, support and active involvement of the international community in the name of humanity (irrespective of their nationality, race, religion, ideologies) has played substantial role in improving disaster management and disaster mitigation;
- C. In the process of improvement in disaster management it is proven that the application of space technology contributes substantially to such efforts;
- D. A better coordination mechanism in dealing with disaster is a real need that should be accommodated by a better legal framework through binding legal instruments and the existence of effective special international organization dealing with it.

GUARANTEEING ACCESS OF DEVELOPING COUNTRIES TO OUTER SPACE^{*}

A. INTRODUCTION

First of all, I would like to express my gratitude for the privilege given to me to provide some comments to the paper prepared by Prof Ram Jakhu titled “Current Legal Issues Relating to Access to Space”. The paper of Prof Ram Jakhu provides us systematic and comprehensive elaboration and analysis regarding main legal issues relevant to access to outer space, which in general be divided into 3 (three) most outstanding issues, namely: the nature and common interest principle as it applies to access to outer space; international space law-making process and its relations with access to space; and the focus on two specific areas of space utilization with respect to compromised between well-recognized legal principles relating to access to space.

In general, the writer shares most of the views of Prof Ram Jakhu on the abovementioned issues. Nevertheless, for the purpose of encouraging discussion and sharing of opinion on these important issues, the writer intends to focus the examination on how the existing fundamental legal

^{*} Discussion Paper presented at IISL Space Law Conference, Beijing April 2004

principles of space law can be effectively implemented in such a way that the actual access of developing countries to outer space can be guaranteed in the global market economy. For that purpose, the elaboration will be directed toward several issues, namely:

- Presenting facts and data on globalization and its relation with the widening disparity between developed and developing countries;
- Conducting some reviews on fundamental legal principles of the existing international space law relevant to access to outer space;
- Identifying the kinds of access that developing countries should be provided;
- Providing some recommendations to guarantee access to outer space.

B. GLOBALIZATION AND ITS IMPACT TOWARDS ACCESS OF DEVELOPING COUNTRIES TO THE WORLD’S RESOURCES TO THEIR BASIC NEEDS

Today we are living in the era of globalization. This globalization era is based on market economy developed after the 2nd World War so called Breton Wood System. It is also within this framework of globalization that the mantra “deregulation, liberalization and privatization” seems to have divine power in directing economic and even the political development of many countries around the world.⁵⁷ It is ironic that after more than 5 decades of implementing the system, the results showing the widening gap between developed and developing countries which can be described by the following facts and data:⁵⁸

- In 1960, one-fifth of the world’s people living in the richest countries had 30 times more income than one-fifth of those living in the poorest countries. By 1997, this income gap had more than doubled to 74 times;
- One fifth of the world’s people living in high income countries had 86% of the world’s GDP, whereas one-fifth of those in poor countries received only 1%;

⁵⁷ Januar Nugroho, “Reinventing Globalization”, Jakarta Post, 30 December 2002

⁵⁸ Ibid, as cited from Ellwood (2001) and Hertz (2001)

- About half of the world’s population lives in less than US\$ 2 a day;
- Over US\$ 1.5 trillion is exchanged every day in currency markets around the world. About 95% of this total represents speculative transactions that fail to benefit the poorest countries;
- The world’s military spending is about US\$ 780 billion per year, while with only US\$ 19 billion per year malnutrition and hunger can be overcome, with only US\$ 21 billion the needs for houses can be overcome, and with only US\$ 2 billion per year the rights of every people to have education can be accommodated;
- There are also data which shows the contrast, where the spending for cosmetics for US Citizens is about US\$ 2 billion per year, and the spending for ice cream for the European reach about US\$ 11 billion, while with only US\$ 9 billion per year all poor people can get access to clean water and sanitation.⁵⁹

The real beneficiaries of globalization seem to be the transnational corporations. Of the top 100 economies, 51 are transnational corporations. The combine sales of the world’s top 200 companies surpass the combined economies of 182 countries.

The above facts and data have shown us that globalization just like everything else under the sun is inherently ambivalent. On the one hand, it brings prosperity, comfort, and convenience in the form of economic growth. But on the other hand, there are vast amounts of casualties from its progress. Environmentally, it can also be said it is hazardous. Globalization of economy with its neo-liberal capitalism only recognizes full competition as the only way to survive (the fittest the best, survival of the fittest).⁶⁰

As neo liberalism is closely related to capitalism, one is of the opinion that capitalism is a millenarian cult, raised to the status of a world religion; it is built upon the myth of endless exploitation. Capitalism believed that theirs will deliver them from infinity. The world’s resources, they assert,

⁵⁹ The speech of Oscar Arias in 1999 as quoted by Maria Hartiningsih in “Neo Liberal Capitalism”, Kompas, 3 February 2003.

⁶⁰ See Maria Hartiningsih, “Ritual to defy the Death”, Kompas, 20 January 2003.

have been granted eternal life.⁶¹ Capitalism seeks a value of production commensurate with the repayment of debt. Other perceives that in the post cold war era, the friendly face of capitalism is not needed anymore. Now Capitalist can do what they like and what they like is simply to make more money for themselves.⁶² And so we see the great banks and corporations merging and acquiring each other to ensure that the tiny banks and businesses in the poor countries will not stand a chance, will be swept aside.

Today the disparity between the rich (developed) and the poor (developing countries) is greater than ever. The richest countries have a per-capita of more than of US\$ 30,000, while the poorest US\$ 30. Of the world six billion people, one billion are underfed, under clothed and without a roof over their heads. Many scrounge in rubbish heaps for food, clothing, and materials for their shelter.⁶³

You might be questioning what is the relevance of the above data to the main issue of guaranteeing access of developing countries to outer space? My answer is very relevant by stating that if the current global market economy cannot cope with the issue of guaranteeing access to the most basic requirements of human dignity (mostly from developing countries), how can it deal with guaranteeing access to outer space? As we are all aware that space utilization is a capital-intensive activity. In addition, with the rapid trends of commercialization and privatization of space activities of which the government's involvement will be less than previously, there is a doubt that the private sectors are willing to set aside some of their revenue and/or profit for guaranteeing access of the developing countries to their needs for space utilization.

⁶¹ George Monbiot, "Capitalist Zeal Nurtures an Illusion of Unlimited Resources", National News Service London as published by the Jakarta Post, 3 January 2003.

⁶² Mahathir Mohammad, "Overcoming Hatred and Greed", Speech at the World Economic Forum, Davos, Switzerland, 23 January 2003.

⁶³ Ibid. See also Kofi Annan, "Business Leaders must not wait for Governments", The Secretary General's address to the World Economic Forum on 4 February 2003.

C. FUNDAMENTAL LEGAL PRINCIPLES OF THE EXISTING LAW RELEVANT TO GUARANTEEING ACCESS TO SPACE

For the purpose of guaranteeing access to space to all countries, particularly to those of developing countries, it is important to examine fundamental legal principles of existing law with the emphasis (by giving special attention) to the principles of public international law and space law. The objectives of this examination are to ascertain that the interpretation and implementation of such principles could accommodate the balance needs and interest of all countries in a just and fair manner. Some of the principles have been discussed in detail in Prof Ram Jakhu's paper. In addition to that, some other relevant legal principles can be further elaborated, as they are closely related to access to space, such as "common interest" in relation to "common property", "common heritage of mankind" (CHM), and "province of mankind; the principle of "equitable access"; "non-appropriation principle"; "principle of international cooperation"; and "peaceful uses".

1. **Common Interest, Common Property, Common Heritage of Mankind (CHM) and the Province of Mankind**

Within the framework of International Law the above similar legal concepts are recognized. They have something in common; they refer to an area beyond national jurisdictions. They also have in common that they cannot be subjected to the sovereignty of any State.⁶⁴

a. *Common Interest*

On the concept of common interest many views have been put forward as to its meaning. On one part, it can be interpreted as a declaration of intent, while on the other hand it can be interpreted as establishing a requirement for States to share all benefits derived from it⁶⁵. Another view divided the common interest concept into speculative common interest and practical common

⁶⁴ See MCW Pinto, "The New Law of the Sea and the Grotian Heritage", in *International Law and the Grotian Heritage, A Commemorative Colloquium*, TMC Asser Institute, The Hague, 1985, pp 81-82.

⁶⁵ See N M Matte, *Space Activities and Emerging Law*, 1984 as quoted by Milton L Smith, *International Regulation of Satellite Communication*, Martinus Nijhoff, 1990, pp 186.

interest⁶⁶. The former requires a wide sharing of resources on the part of the more fortunate States with the less fortunate, while the latter relies on political will in the implementation of such sharing⁶⁷.

The concepts of common interest are relevant when applied to valuable (explorable, usable, exploitable) area beyond national jurisdiction, especially when it is considered that one claim might take the form of an assertion of ownership or dominium⁶⁸.

b. *Common Property*

The concept of common property was inspired by the concept of Roman law. This concept was used and developed by Grotius to place the open sea (mare liberum) in a category of things which by consensus of opinion of all mankind are forever exempt from national ownership in account of their susceptibility to universal use⁶⁹.

c. *Common Heritage of Mankind (CHM)*

The view has been expressed that the CHM is an extension of the Res Communis Humanitatis concept, since it is open for inclusive use and denies exclusive use. But it goes further by asserting that there must be a sharing of the benefits and the values derived from it⁷⁰. Another view was expressed by the opinion that the CHM is the modern version of Res Communis, which applies to another, namely a right to use the resource.⁷¹ It was further stated that a Res Communis cannot be owned, but it may be used on the basis of the equality of all States. Equality presupposes that at least access to common areas beyond national jurisdiction is open to all, without any constraints, as long as it does not establish any exclusive and discriminatory uses⁷².

⁶⁶ Carl Q Christol, *Space Law: Past, Present and Future*, Kluwer Taxation Publisher, 1991, pp.376.

⁶⁷ Ibid.

⁶⁸ Ibid. pp 379-380.

⁶⁹ See MCW Pinto, *op.cit*, pp 81.

⁷⁰ See Carl Q Christol, *op.cit*, pp 382.

⁷¹ See Besss CM Reijnen, *The United Nations Space Treaties Analyzed*, Editions Frontieres, 1992, pp 3.

⁷² See Ibid, pp 4.

In general, there are two (2) primary theories regarding the CHM:

- 1) The first theory holds that the CHM established common ownership in which all countries are entitled to substantive property rights over the natural resources of an area that is the CHM⁷³. In essence this type of CHM concept would secure economic benefit for developing countries that may have cost them nothing. It is not surprising; therefore, that many of the proponents of this theory are from developing countries⁷⁴.
- 2) The second theory is quite different. It considers that the above theory is “foreign to existing international law and might even come into conflict with existing rules of international law”⁷⁵. Instead it holds that the CHM is simply a continuation of general concept Res Communis and the Common Interest⁷⁶.

The concept of CHM has been expressly and impliedly mentioned in several UN Documents⁷⁷.

d. *The Province of Mankind*

The province of all mankind is seen as a principle which unifying a number of other general and specific rights and duties contained in article XI (1) of Space Treaty of 1967. The word “province” refers to “sphere of works”⁷⁸ or “benefit”⁷⁹ while the words

⁷³ See Milton L Smith, “The Commercial Exploitation of Mineral Resources in Outer Space”, in Space Law, Views of the Future, Tanja L Zwaan (ed), Kluwer 1988, pp 51.

⁷⁴ See I.B.R Supancana, The International Regulatory Regime Governing the Utilization of Earth-Orbits, Doctorate Thesis, Leiden University, The Netherlands, 1998, pp 45.

⁷⁵ Milton L Smith, supra note 17, pp 51.

⁷⁶ See Kevin B Walsh, “Controversial Issues under Article XI of the Moon Treaty”, Annals of Air and Space Law, Vol VI, 1981, pp 481.

⁷⁷ Among others:

- UNGA Resolution No. 1962 (XVIII) of 1963;
- The Outer Space Treaty of 1967, article I;
- The UNGA Declaration on Principles Governing the Seabed and Ocean Floor of 1970;
- The Moon Agreement of 1979, Article XI, 1;
- The UNCLOS of 1982, article 133 and 136.

⁷⁸ Wassenbergh, Principles of Outer Space Law in Hindsight, Martinus Nijhoff Publishers, 1991, pp 57.

⁷⁹ Carl Q Christol, op.cit, pp 71.

“mankind” refers to “the society of States”.⁸⁰ Thus the province of all mankind principle refers either to the “sphere of works of the society of States” or to the “benefit of all mankind”. Apart from the fact that there are possibly different interpretation on the meaning of “the province of all mankind” principle, in practice this principle has been adopted as a guidance for conducting exploration and use of outer space, including the moon and other celestial bodies. In the context of access to space utilization this principle shall be applied.

2. **The Principle of Equitable Access**

Another important principle that should be taken into serious consideration in space utilization is the principle of “equitable access”. In the existing Space Treaties, the term “equitable access” is not mentioned. The standard terms being used in such treaties are “equality”;⁸¹ “equitable sharing”;⁸² “equitable measures”;⁸³ “equity”.⁸⁴ In contrast, the term “equitable access” is being used in the International Telecommunication Conventions.⁸⁵

The Black Law Dictionary defines the term “equitable” as “just, fair and right in consideration of the facts and circumstances of the individual case”.⁸⁶ While the Oxford Handy Dictionary defines the term as “fair, just, and valid in equity”.⁸⁷ Equity was defined as “fairness; use of principle of justice to supplement law, system of law so developed”⁸⁸ and equality is defined as “being equal, become equal”.⁸⁹

“Equitable” should in a broader sense, means to cover balanced, just, fair and proportional in relation to certain special conditions

⁸⁰ Wassenbergh, loc.cit

⁸¹ See Article I and X of The Space Treaty of 1967.

⁸² See Article 11 (7) d of the Moon Treaty of 1979.

⁸³ See Paragraph 4 of the Preamble of the Liability Convention of 1972.

⁸⁴ See Article XII of the Liability Convention of 1972.

⁸⁵ See Article 33 (2) of the ITU Convention 1973; Resolution no 3 of the WARC 1979; Article 33 ITU Convention 1982; Article 44 of the ITU Constitution 1992.

⁸⁶ Blacks Law Dictionary

⁸⁷ The Oxford Handy Dictionary, Chancellor Press, 1986, pp 287

⁸⁸ Ibid.

⁸⁹ Ibid.

(circumstance). Moreover, the principle of equitable access should meet not only the existing needs, but also future needs.

In order to guarantee the actual access of developing countries to space, for example to limited natural such as earth-orbits spectrum resource, it is necessary to formulate criteria on the issue of “equitable access”. Such criteria could be formulated in a “general” and “flexible” way to cope with certain future changes by considering certain aspects, such as:

- the efficient and economical use;
- the balanced needs of the first user and subsequent user;
- the ability to get access (technically and financially);
- the interest of developing countries;
- the geographical situations of particular countries;
- the development in the field of science and technology;
- a non-discriminatory basis to guarantee future access.

3. **Non-Appropriation Principle**

There are several interpretations of the meaning of non-appropriation as stated in article II of the Space Treaty of 1967. One is that the non-appropriation principle was adopted to implement the freedom of use doctrine, because, quite simply, appropriation of a resource by a single state would usually be inconsistent with freedom of use by all States. If it is a scarce resource, appropriation is generally considered to be the taking of property for exclusive use with a sense of permanence. Appropriation of outer space, therefore, is the exercise of exclusive control or exclusive use of outer space on a permanent basis.⁹⁰ Another opinion states that every use could be legitimate as long as it does not exclude “other” permanently from such use or impose undue restrictions.⁹¹ The principle of non-appropriation was reiterated in the

⁹⁰ See Milton L Smith, “Compliance of the Post WARC ITU Regulatory Regimes with International Space Law”, paper presented at the IISL Colloquium, 1990, pp 1.

⁹¹ See Valters, “Perspectives in Emerging Law of Satellite Communication”, *Stanford Journal of International Studies*, vol. 5, 66-67, 1970, pp 23.

Moon Agreement of 1979,⁹² in which non-appropriation is meant to prohibit ownership⁹³. Though it prohibits ownership, there are still activities which are not prohibited, such as: the placement of personnel, space vehicles, equipment facilities, stations and installations on or below the surface of the moon, including structures connected with their surface or sub-surface. The rights to collect and to use moon samples for scientific are also not prohibited.

In the context of access to space resource, the non-appropriation principle can be described as follows:

- It cannot be made subject to sovereignty of any State;
- It cannot be made public property (ownership);
- It cannot be exploited until an international regime is established;
- It cannot be used exclusively;
- It cannot be utilized on permanent basis.

4. **Principle of International Cooperation**

The principle of international cooperation or the principle that exploration and utilization of outer space shall be for the benefit and in the interest of all countries is laid down in article I (1) of the Space Treaty of 1967. There were two (2) different standpoints on this article when it was formulated:

- a. The developed countries agreed that this principle set forth limitations and obligations to the use of outer space, but it did not diminish their inherent rights to determine how they share the benefits derived from their space activities;
- b. The developing countries believed that this principle was not only an appeal to all States to conduct their space activities on a cooperative international basis, but actually imply that they have an obligation to do so.⁹⁴

⁹² Article XI (2) of the Moon Agreement of 1979 stating: “The Moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means”.

⁹³ See Kevin B Walsh, *op.cit*, pp 43.

⁹⁴ Nandasiri Jasentuliyana, “Ensuring Access to the Benefits of Space Technologies for All Countries”, *Space Policy*, February 1994, pp 8-9.

As the consequence of their standpoint most of developed countries are of the opinion that there is no formal mechanism to enforce this principle, while some developing countries insist that there should be a requirement for a stricter and codified international legal instrument to ensure cooperation and access for all countries.⁹⁵

The question of the need to establish a cooperation mechanism to guarantee the exercise of this principle has been a concern of the UNCOPUOS and adopted as the agenda item of the Legal Sub Committee of the UNCOPUOS under the title “Consideration of the legal aspects related to application of the principle that the exploration and utilization of Outer Space shall be carried out for the benefit and in the interests of all States, taking into particular account the needs of developing countries”. During the Legal Subcommittee sessions of 1992-1993 the developing countries (G 77) submitted a working paper entitled “Principles regarding international cooperation in the exploration and utilization of outer space for peaceful purposes”.⁹⁶ The working paper elaborates six (6) principles, with emphasis on the following:

- States are sovereign in deciding the modalities of their cooperation;⁹⁷
- The main objectives pursued by international cooperation should be the development by all States of indigenous capability in space science and technology and their applications;⁹⁸
- International cooperation should be conducted for peaceful purposes and on a non-discriminatory basis;⁹⁹

⁹⁵ Ibid. pp 9.

⁹⁶ UN Doc A/AC.105/C.2/L.182 of 9 April 1991. Submitted by Argentina, Brazil, China, Mexico, Nigeria, Pakistan, The Philippine, Uruguay and Venezuela. This was further revised as appeared in UN Doc.A/AC.105/C.2/L.182 /Rev.1 of 31 March 1993.

⁹⁷ See Ibid, principle I.

⁹⁸ See, Ibid, principle III.

⁹⁹ See, Ibid, principle IV.

- The need to preserve the outer space environment;¹⁰⁰
- The need to strengthen and enlarge the role of the UN and its scope of activities.¹⁰¹

At the Thirty-Fourth Session of the Legal Subcommittee in 1995 a revised version to the previous working paper from developing countries was submitted.¹⁰² A joint working paper prepared by Germany and France was also submitted.¹⁰³ In general, the two working papers had some substances in common:

- the requirement to guarantee a State's sovereignty to determine their form and level of cooperation;
- the scope of cooperation to be regulated should cover all forms of cooperation, either bilateral, multilateral, non-governmental or inter-governmental.

The differences between the two working papers were that the developing countries' working paper is aimed at adopting a resolution which will further be directed toward a regulation of international cooperation by stressing the principles of "sovereignty", "equity" and promoting "indigenous capability", while the German/French working paper emphasizes the need for a non-binding declaration; a reference to intellectual property, and focusing international cooperation on the application of space technology.

In 1996 a UNGA resolution was adopted titled "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".¹⁰⁴ There are important provisions in the declaration, namely:

¹⁰⁰ See, *Ibid.* principle V.

¹⁰¹ See, *Ibid.*, principle VI.

¹⁰² UN Doc.A/Ac.105/C.2/L.182/Rev.2.

¹⁰³ UN Doc.A/AC.105/C.2/L.197.

¹⁰⁴ UNGA Resolution No 51/122, 13 December of 1996

- States are free to determine all aspects of their participation in international cooperation on an equitable and mutually acceptable basis;
- International cooperation should be conducted in the modes that are considered most effective and appropriate by the countries concerned including inter-alia, governmental and non-governmental, commercial and commercial; global, multilateral, regional or bilateral; and international cooperation among countries in all level of development.

5. The Principle that Outer Space, including the Moon and other Celestial Bodies should be Utilized for Peaceful Purposes

Under the existing International Outer Space Law this principle is laid down in all space treaties,¹⁰⁵ also in the UNGA resolutions. Yet, no treaty concerned with outer space activities defines the meaning of “peaceful” and “exclusively for peaceful” purposes.

The term “peaceful” in relation to outer space activities was interpreted by the United States to mean “non-aggressive” rather than “non-military”. Accordingly, all military uses are permitted and Lawful as long as they remain “non-aggressive” as per article 2(4) of the United Nations Charter, which prohibits “the threat or use of force”. By contrast, the former USSR publicly took the view, despites its own military use of outer space, that “peaceful” meant “non-military”, and that in consequence all military activities in outer space were “non-peaceful” and possibly illegal.¹⁰⁶

For guaranteeing access to space to all countries, particularly those of developing countries, it is important to ascertain that space utilization will be dedicated “exclusively for peaceful purposes”. To

¹⁰⁵ See article IV (2) of Space Treaty of 1967; Preamble of the Rescue Agreement of 1968; Preamble of the Liability Convention 1972; Preamble of the Registration Convention 1975; and article 3 (1) of the Moon Agreement 1979.

¹⁰⁶ Ivan A Vlasic, “The Legal Aspects of Peaceful and non-Peaceful Uses of Outer Space”, in *Peaceful and non-Peaceful Uses of Outer Space*, Bhupendra Jasani (ed), Taylor and Francis, New York, 1991, pp 40.

achieve that, further clarification on the meaning of peaceful should be examined, which covers such as:¹⁰⁷

- the meaning of “mass destruction weapons”;
- the meaning of “non-aggressive”;
- technical parameters to identify whether an activity can be classified as “peaceful”;
- whether non-military activities which are aggressive can also be classified as “peaceful”;
- which institution should be given a mandate to discuss the implementation of the principle that outer space should be used for peaceful purposes?

Though there is no official definition of the terms “mass destruction weapons”, it is generally accepted as referring to “chemical weapons”, “biological weapons”, “laser beams weapons”, etc. But to assess whether an activity is “non-aggressive” is in fact not a simple matter, since it is open to a very broad interpretation and therefore could become too subjective. Examples are whether the use of satellite for verification; the use of military satellite for supporting civil navigation systems; and the use of civilian remote sensing satellite for military purposes could be classified as “non-aggressive”? To answer these questions, maybe the use of some parameters (legal, political, technical) must be considered. An example of this idea is the establishment of technical parameters, for instance based on their orbital parameter; or a military doctrine that dictates the use of force.¹⁰⁸

Another important issue that should be resolved in this regard is which international institutions have the competence to discuss or to verify or to make an assessment whether an activity is “peaceful” or “non-peaceful”? On the one hand the space powers refused to discuss the issue within the framework of the UNCOPUOS since it has no mandate to do so. But on the other hand, the Conference

¹⁰⁷ I.B.R Supancana, *op.cit*, pp 60.

¹⁰⁸ See Bhupendra Jasani, *Ibid*, pp 9.

of Disarmament (CD) is only relevant to the issue of armament/disarmament. Thus, a “legal lacuna emerge” in a situation where a non-military activity is aggressive in nature.

D. THE SCOPE OF ACCESS TO SPACE THAT DEVELOPING COUNTRIES DESERVE

For the purpose of guaranteeing access of developing countries to space, it is important to define the scope of access that developing countries deserve. In general, access to space can be divided into:

- 1. Access of Developing Countries to the Taking of Benefits from Natural Resources in Outer Space, including the Moon and other Celestial Bodies**

With the rapid growth of commercialization and privatization of space activities in the era of global market economy, the issue of access of developing countries to space is relevant and therefore, should be seriously considered. Especially when it deals with fulfillment of their basic needs of which space science and technology may contribute at an affordable price. This makes sense, as developing nations are in general lacks of financial and technical capabilities.¹⁰⁹

In recent years, we can observe the increasing utilization of natural resource in outer space, especially earth-orbits spectrum resource (GEO, HEO, MEO/ICO, LEO) for certain activities. As it is generally recognized that earth-orbits spectrum resources are limited natural resources, there must be an evaluation to the existing law whether it is able to accommodate the interest of both developed and developing countries in a fair, just and equitable manner.

¹⁰⁹ In addition, they also lack of scientific infrastructure; lack of data and information; lack of sufficient scientific infrastructure etc. For detail analysis, see I.B.R Supancana, “The Commercialization of Space Activities, Challenges and Opportunities for Developing Countries”, paper presented at UN/Indonesia Regional Conference on Space Science and Technology for Sustainable Development, Bandung, Indonesia, 17–21 May 1993. See also I.B.R Supancana, “Commercial Utilization of Outer Space and Its Legal Formulation- Developing Countries’ Perspectives”, Proceedings of the IISL Thirty-Fourth Colloquium on the Law of Outer Space, Montreal-Canada, 1991, pp 348-356.

Previously regulations concerning access to earth-orbits spectrum resource are mainly based on “first come, first serve” principle which are more favorable in accommodating the interest of developed countries. However, consistent efforts on the part of developing countries to get a fair and just access to this limited natural resource have shown substantial progress. This can be seen in the outcome of World Administrative Radio Conferences of the ITU at their 1985 and 1988 sessions. The concept of “apriori planning” and “simplified improved procedures” provides guarantee for access, particularly those of developing countries. Furthermore, the concepts are elaborated in the amendment of the ITU Convention as appears in ITU Constitution of 1992. In the practical management of earth-orbits’ utilization some new rules have been applied such as “administrative due diligence” and “financial due diligence” to prevent the abuse of rights in the ITU’s registration process like: “paper satellites”, “excessive and un-proportional” application.

With regard to other natural resources on the Moon and other celestial bodies, some anticipation has to be made in the form of formulating international legal regime which would accommodate the balance interest of both developed and developing countries. To achieve this objective, some criteria shall be developed which cover, among others:

- the international legal-regime should be based on solid, acceptable and accountable theoretical bases/ grounds;
- the International legal-regime should take into consideration and anticipating the development in space science and technology and its applications, including optimization of natural resources on a commercial basis;
- the international legal regime shall be developed based on effective property rights system;
- the international legal-regime shall develop rights and obligations of “user”, which cover States and non-State actors;
- etc.

2. **Access to the benefits from the application of space science and technology**

In the last few years, we could observe a tremendous growth of space applications to serve different scope of activities. The application of space science and technology was proven to be of benefit to support the creation of globalization. The use of satellite constellations for a superhighway of information was one of the examples, also to support certain activities such as: air traffic, city planning, tele-education (distance learning), tele-medicine, exploration of natural resource etc. In short, the application of space science and technology could be dedicated to fulfill some basic human needs.

Since early of 1990's the application of space science and technology has entered into a new era, the era of commercialization and privatization. Consequently, space science and technology, which was formerly dedicated to serve military and State's activities, have been converted into civil and commercial purposes. From one perspective, we can see that commercialization and privatization may create competition, which at the end will provide the best quality of services at competitive price. But from another perspective, if it is implemented on purely commercial basis, it will prevent the less fortunate to get access to such services as they cannot afford to pay such services. Thus, only those who have sufficient financial capability will be able to enjoy the benefits derived from the application of space science and technology. In such a situation, the application of space science and technology cannot accommodate the needs and Interest of the less fortunate, in this case the developing countries.

In order to open more access for the taking of benefits from the application of space science and technology, some principles shall be formulated and consistently implemented, among others:

- The principle of universal service obligation;
- The principle of protecting global public interest;
- The principle of creating a proper legal framework and regulatory structure;

- The principle of implementing legal approach to balance between commercialization, privatization and globalization and the protection and enhancement of public interest.

If the above principles can be successfully implemented, space services will become affordable to both developed and developing countries.

3. **Access to Space Science and Technology**

One of the ways to promote the utilization of space science and technology for the prosperity of mankind is by conducting transfer of space science and technology and know-how from developed countries to developing countries. This can be done through dissemination of information in order to develop genuine capabilities of all countries in space science and technology for the purpose of fulfilling their specific needs. In addition, the establishment of an effective scheme of cooperation both at global, regional, multilateral and bilateral level will play key roles in guaranteeing access to space science and technology. For the sake of securing application of space science and technology shall only be for peaceful purposes, comprehensive measures may be taken, including but not limited to: establishing a verification system recognized by all countries with clearly defined parameters (legal, political and technical) and supported by effective law enforcement mechanism conducted by relevant international organizations.

4. **Access to Enter into International Market**

As the result of the process of transfer of technology, there will be a situation where developing nations possess genuine capabilities in space science and technology. Consequently, there is a need to provide their services not only within their local market, but also overseas market. In such situation, the international market shall be opened. Free and fair competition shall be created and secured subject to certain restrictions based on global security reasons. No restrictions may be imposed by the space powers only to prevent product and services

coming from developing countries in contrary with the recognized international trading system.

E. CONCLUDING REMARKS

To conclude my comments, some conclusions and recommendations can be addressed, namely:

1. As it is widely recognized that the application of the progress in space science and technology have brought substantial contribution to the betterment of human's life, there is a need to guarantee access to such achievement for all countries, particularly those of developing countries.
2. In order to guarantee such access, a strong political will from all countries is required and shall be reflected in the form of standardized national legislations governing space activities both conducted by state and non-state actors.
3. Standardized national space legislations shall be developed in accordance with the existing public international law and particularly international space law.
4. Existing legal principles and legal concepts under existing international space law such as: common interest, common heritage of mankind, equitable access, non-appropriation, international cooperation, and peaceful purposes shall be interpreted and implemented in such a way that it would guarantee access to outer space to all countries, including those of developing countries on a proportional and fair manner so as to accommodate the balance interest of developed countries and developing countries.

Access of developing countries to outer space shall be understood to include: access to the taking of benefits from natural resources in outer space; access to the benefits from the application of space science and technology; access to space science and technology; and access to enter into international market.

**INTERPRETATION AND IMPLEMENTATION
OF INTERNATIONAL SPACE TREATIES
AND ITS IMPLICATIONS TO
THE FORMULATION OF NATIONAL SPACE
LEGISLATION
(AN INDONESIAN EXPERIENCE)***

I. INTRODUCTION

As an archipelagic State with specific geographical situation, Indonesia has a strong interest in mastering and applying space science and technology to fulfill the needs of its national development. To come to that end there is a requirement to develop national legal system relevant to space activities through existence of national space legislation would guarantee that space related activities can be conducted in an orderly manner and shall promote prosperity and the betterment of the society. In the process of formulating national space legislation, the following aspects shall be taken into considerations:

1. It should be based on national interests;
2. It should not be in contrary with the existing national law;

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Ratified by Law No 16 of 2002

3. It should not be in contrary with principles and rules of international space law.

Indonesia has currently ratified 4 (four) international space treaties, namely:

- The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies or known as “Space Treaty of 1967”¹¹⁰
- The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of 1968 or known as “the Rescue Agreement of 1968”;¹¹¹
- The Convention on International Liability for Damages Caused by Space Objects or known as “the Liability Convention of 1972”;¹¹² and
- The Convention on Registration of Objects Launched into Outer Space of 1975 or known as “the Registration Convention of 1975”.¹¹³

Meanwhile “the Moon Agreement of 1979” has not been ratified as it is deemed “not urgent”. By ratifying the abovementioned international space treaties, Indonesia has transformed the provisions of those treaties from the norms of international law into a part of national law. Consequently, every effort to formulate national space legislation shall take into consideration and subject to existing international space law. The problem is that in further development of space activities some States tend to have taken different the process of national space legislation. It is expected that the positions regarding interpretation and implementation of international space treaties in accordance with their own national interests. Indonesia has also put national interests as basic considerations in formulating national space legislation, especially in the process of drafting national space act.

The purpose and objectives of this paper are to make some analysis regarding:

1. Interpretation of international space treaties;

¹¹⁰ Ratified by Presidential Decree No 4 of 1999

¹¹¹ Ratified by Presidential Decree No 4 of 1999

¹¹² Ratified by Presidential Decree No 20 of 1996

¹¹³ Ratified by Presidential Decree No 5 of 1997.

2. Implementation of international space treaties as reflected in national space legislations and practices;
3. Implications of the interpretation and implementation of international space treaties toward the process of formulating national space legislation, especially the drafting of Indonesian Space Act.

In order to have an easy understanding of the legal aspects related to interpretation, implementation and implication of international space treaties toward the formulation of national space legislation, this paper will focus on examining the four treaties, namely: “the Space Treaty of 1967”, “the Rescue Agreement of 1968”, “the Liability Convention of 1972” and “the Registration Convention of 1975”.

Although no ratification has been made to “the Moon Treaty of 1979”, some issues relevant to it will be discussed, such as the possibility to establish international legal regime as an elaboration of “common heritage of mankind” (CHM) for exploitation of natural resources of the Moon. Other treaties such as “the Test Ban Treaty”, “the Nuclear Proliferation Treaty”, “the ITU Constitution and Convention” and “the Missiles Technology Control Regime” (MTCR) will also be touched, although not in depth.

II. THE SPACE TREATY OF 1967

A. Main Principles

As “Magna Charta” of space activities, the Space Treaty of 1967 containing basic principles for conducting space activities, covering:

1. Freedom of exploration and use of outer space, including the moon and other celestial bodies on a non-discriminatory basis;¹¹⁴
2. Outer space, including the Moon and other Celestial Bodies is not subject to national appropriation;¹¹⁵
3. Applicability of international law, including Charter of the United Nations to space activities;¹¹⁶

¹¹⁴ See article I of The Space Treaty of 1967.

¹¹⁵ Ibid, article II.

¹¹⁶ Ibid, article III.

4. Peaceful uses of outer space;¹¹⁷
5. The Status of Astronaut as the envoys of mankind;¹¹⁸
6. State responsibility and international liability for national space activities;¹¹⁹
7. Jurisdiction and Control of State of Registry over its objects launched into outer space;¹²⁰
8. Preservation and Protection of the Environment;¹²¹
9. International Cooperation.¹²²

Considering the universal character of the above principles it is no wonder that about 98 (ninety-eight) countries have ratified the Space Treaty of 1967.¹²³ In practice even the non- contracting parties to the treaty respect and subject to the provisions of the Space Treaty of 1967 in conducting their space activities. In this context, the Space Treaty of 1967 has become “the Law-Making Treaty” instead of “Treaty Contract”.

B. The Issues of Interpretation and Implementation of the Space Treaty of 1967

Despite the universal character of the Space Treaty Provisions, there are countries and even experts who have different interpretation and implementation on the Space Treaty’s provisions. Some examples of the differences could be described as follows:

1. Whether the “province of mankind”¹²⁴ has the same meaning as “common heritage of mankind”.¹²⁵ though the two terminologies

¹¹⁷ See *ibid* Article IV.

¹¹⁸ *Ibid*, article V.

¹¹⁹ *Ibid*, article VI and VII.

¹²⁰ *Ibid*, article VIII.

¹²¹ *Ibid*, article IX.

¹²² *Ibid*, article XI.

¹²³ As of 1st January, 2003.

¹²⁴ The word “province” refers to “sphere of works” or “benefit” while the words “mankind” refers to “the Society of States”. For further analysis see, H A Wassenbergh, *Principles of Outer Space Law in Hindsight*, Martinus Nijhoff Publisher, 1991, page 57.

¹²⁵ For further analysis of the CHM concept, see Carl Q Christol, *Space Law: Past, Present and Future*, Kluwer Taxation Publisher, 1991, page 382. See also Bess CM Reijnen, *The United Nations Space Treaties Analyzed*, Editions Frontieres, 1992, page 3-4.

have similarities as it belongs to area beyond national jurisdiction but different interpretations may lead to different implementation;

2. On the status of outer space as “province of mankind” and “common heritage of property”;
3. Concerning the “non-appropriation” principle, on one hand it was interpreted by the US delegate as not subject only to national ownership (sovereignty) while it is open for private ownership depending upon national law of each country, on the other hand several other developed countries (such as: Italy, France and the Netherlands) are of the opinion that “non-appropriation” shall apply not only to state, but also to other legal entities;¹²⁶
4. On the meaning of “peaceful”, the formulation of the Space Treaty is line (concur) with interpretation made by the US government which refers to “partial demilitarization” (as long as not-aggressive),¹²⁷ while other country (for example Iran) is still questioning such interpretation especially in relation with another interpretation made by the former USSR which interpreted “peaceful” as “non-military”¹²⁸
5. There are still some countries, which fail to make a clear distinction between “state responsibility” and “international liability”. Legally, a distinction should be made between responsibility and liability. Responsibility is a legal obligation that should be exercised by one party vis-à-vis another.¹²⁹ Responsibility is primarily conceived as meaning answerability for the conformity of conduct with norms in general whether legal, moral or other. It is broader notion than

¹²⁶ The statements were made during the UN/Korea Workshop on Space Law, Daejeon, Republic of Korea, 3-6 November of 2003.

¹²⁷ For further elaboration of the interpretation of “peaceful”, see Ivan A. Vlastic, “The Legal Aspects of Peaceful and non-peaceful of Outer Space”, in Peaceful and non-Peaceful Uses of Outer Space, Bhupendra Jasani (ed), Taylor and Francis, New York 1991, page 40.

¹²⁸ Such statement was addressed by the delegate from Iran at the UN/Korea Workshop on Space Law, Daejeon, Republic of Korea, 3-6 November 2003.

¹²⁹ On etymological analysis regarding the distinction between “responsibility” and “liability” see, Nathalie L.J.T Horbach, Liability Vs Responsibility Under International Law, Ph.D Thesis Leiden University, the Netherlands, 1996, page 21. See also, Bin Cheng, Studies in International Space Law, Clarendon Press, Oxford, 1997, page 603.

liability which constitutes the legal obligation to make integral reparation for the damage resulting from unlawful conduct;¹³⁰

6. Regarding the obligation to conduct “international consultation”, different interpretation still exists, mainly in the event that such consultation is requested by country which potentially would suffer from the impact of space activities conducted by other country. In case such consultation fail to resolve the disputes, there is no (legal) procedures available to impose obligation to the launching state to stop its activities;
7. The lacks of clear criterion regarding qualification of which “space crew” can be categorized as “astronaut” and consequently can be regarded as “envoys of mankind”. This is important considering the future trends of sending more personnel (including space tourist) to outer space of which is not worth to be treated as “envoys of mankind”;
8. The failure to make clear which country shall be qualified as “appropriate state”, whether it only includes “launching state”, and “state of registry” or also includes “the state which issues a license” for conducting space activities;
9. The need for redefinition of certain terminologies, such as: “space activities”, “space objects”, “launching state”, “national activities” etc.

C. **The Implication towards the formulation of National Space Legislation**

The implication of the different interpretations and implementations of the Space Treaty’s principles may of course affect the formulation of the draft of national space act. Therefore, a close look at the issues has been conducted prior to incorporating the principles of Space Treaty of 1967 into the draft of national space act. The parameter being used is the national interests, especially in the context of space activities. Some examples of national position, which has been taken

¹³⁰ See, Bin Cheng, “Space Activities, Responsibility and Liability”, 11 EPIL, 1989, page 299.

in connection with interpretation and implementation of the Space Treaty, are as follows:

1. The determination on the status of outer space, including the moon and other celestial bodies as “province of mankind” and “common heritage of mankind” which cannot be subjected to national appropriation (sovereignty);
2. “Province of Mankind” and “Common Heritage of Mankind” shall be understood as “common ownership” prior to the existence of a special legal regime as an elaboration of those legal concepts. This position is necessary to prevent the utilization of space resources that merely based on “first, come first served” principle or technical and financial capabilities of certain countries;
3. On the application of “non-appropriation” principle, it should be inferred as covering both not subject to “national appropriation” (ownership) and “private ownership” as long as it is not based on the existence of an international legal regime;
4. Concerning the meaning of “peaceful”, certain parameters (legal, political and technical) shall be determined equipped with its verification system to ensure that the utilization of outer space shall be exclusively for peaceful purposes;
5. Regarding the meaning of “launching state”, there is a need for a redefinition in the context of participation of private entities in commercialization of space activities; therefore, it is necessary to introduce the term “launching authority” in addition to “launching state”. Besides, new modus for launching such as: “air launch” and “sea launch” may affect the further definition of “launching state”;
6. As a country, which on one hand is active in utilizing space science and technology, while on the other hand it may become potential victims of space activities, Indonesia shall pay attention to the interpretation of “international consultation” from the perspectives of securing national interest;

7. Considering the close connection among “registration”, “jurisdiction” and “control” over space objects with the issue of “state responsibility” and “international liability”, further in depth observation shall be conducted on these issues, including for a situation where space activities are conducted by non-State legal entity.

III. THE RESCUE AGREEMENT OF 1968

A. Basic Provisions

“The Rescue Agreement of 1968” is an elaboration of the provision of article V of the “Space Treaty of 1967” stating that “astronaut is the envoys of mankind”. As consequence of the status of astronaut as envoys of mankind, contracting parties to this agreement are obliged to take all necessary measures and to render assistance to the astronaut in case of accident, emergency landing, or in distress, and to return the space objects to the “launching State”.

The Rescue Agreement of 1968 consists of 10 (ten) articles and comprising of the following main provisions:

1. The contracting party shall notify either the launching authority or the Secretary General of the United Nations of any information or finding regarding astronaut in situation of accident, emergency landing or in distress within the jurisdiction of other contracting States;¹³¹
2. The contracting party shall immediately take all possible steps to rescue the astronaut, to render them all necessary assistance and to inform the launching authority and the Secretary General of the United Nations of the steps it is taking and of their progress;¹³²
3. The contracting party with the closest distance from the location of the accident on the high seas shall, and in a position to do so, shall extend assistance in search and rescue operations for such personnel to ensure their speedy rescue;¹³³

¹³¹ See Rescue Agreement of 1968, article 1.

¹³² See Ibid, article 2.

¹³³ Ibid, article 3.

4. The contracting party shall return astronauts and space objects to the launching authority;¹³⁴
5. The launching authority shall be responsible for expenses incurred in fulfilling obligations to recover and return a space objects or its component parts;¹³⁵
6. Launching authority shall refer to the State responsible for launching, or, where an intergovernmental organization is responsible for launching, that organization, provided that the organization declares its acceptance of the rights and obligations provided for in this agreement.¹³⁶

B. **The Issues of Interpretation and Implementation of the Rescue Agreement of 1968**

Ideally, provisions of the Rescue Agreement of 1968 should not raise any problems since it stresses the humanity aspects of space activities, nevertheless in its implementation some practical problems may arise, such as:

1. With respect to the recent development of space activities which involve personnel such as: “payload specialist”, “researcher”, “scientist”, and even “military personnel”, including “space tourist” or “space passengers”, the question may arise whether these personnel can be classified as “astronaut” with the status of “envoys of mankind”. If not what parameters can be used to distinct them?
2. Whether the contracting party is still obliged to render assistance and to rescue astronaut of another country which conducted unfriendly military (reconnaissance) mission against the contracting party;
3. What is the law enforcement mechanism to the contracting party, which refuses to render assistance in accordance with their obligations under the Rescue Agreement?

¹³⁴ Ibid, article 4.

¹³⁵ See Ibid, article 5 paragraph 5.

¹³⁶ See Ibid, article 6.

4. Why the term “launching authority” only apply to states and intergovernmental organizations? How about if the launching is purely conducted by private entity, whether they can be classified as “launching authority”;
5. Considering the fact that Rescue Agreement is relatively an old agreement, whether it is a proper time to make amendment and/or adjustment to the provisions which is regarded as “out of date”.

C. Implication towards the Formulation of National Space Legislation

By taking into considerations of existing problems regarding the interpretation and implementation of the Rescue Agreement, for the purpose of integrating provisions of the Rescue Agreement into the draft of national space act, it shall be conducted in such a manner that it pays attention to and anticipate the recent development, and particularly the national interests.

The steps that can be taken will include but not limited to:

1. Regulating coordination mechanism among relevant institutions in conducting search and rescue of astronaut and space objects, including its component parts in case of accident, emergency landing and/or in distress;
2. Redefining the meaning of “astronaut” in line with the recent development by formulating objective parameters regarding the qualification of “astronaut”;
3. For activities, which is proved to be “unfriendly” and in contrary with the principle of peaceful uses of outer space, the obligation as laid down in Rescue Agreement shall be treated as not binding
4. Broaden the meaning of “launching authority” to also cover space activities conducted by private entities, non-governmental organizations and even individuals.

IV. THE LIABILITY CONVENTION OF 1972

A. Basic Provisions

Liability Convention of 1972 elaborates principles as formulated in article VI and VII of the Space Treaty of 1967. The main characteristic of Liability Convention is “victim oriented” as it is designed to protect the interests of the third party (country) which is not involved in conducting space activities, but could become “potential victims” of such activities. The essence of this convention is providing procedures and mechanism for international liability for damages caused by space objects.

Liability Convention consist of 28 (twenty-eight) articles containing the following basic provisions:

1. Certain terminologies and definitions, such as: “damages”, “launching”, “launching State”, “space objects”¹³⁷;
2. The application of 2 (two) basis of liability, namely, “absolute liability” and “liability based on fault”. Absolute liability applies in the situation where the damages occur on the surface of the earth or on aircraft in flight,¹³⁸ while liability based on fault applies if the damages occur in outer space;¹³⁹
3. The parties, which shall be liable for damages caused by space objects, are “the launching states” which includes: the state which actually launch, the state which procure the launch, and the state which provide facilities and territory for the launch.¹⁴⁰ In the event of joint launching, the launching states shall be jointly and severally liable to the third state;¹⁴¹
4. The claim for compensation for the damages may be presented by the state of whose natural or juridical persons suffer the damage; another state in respect of damage sustained in its territory; or

¹³⁷ See Liability Convention of 1972, article I.

¹³⁸ Ibid, article II.

¹³⁹ Ibid, article III.

¹⁴⁰ Ibid, article I (c).

¹⁴¹ Ibid, article IV and V.

another state in respect of damage sustained by its permanent residents;¹⁴²

5. Procedure of claim for compensation in the first instance shall be presented through diplomatic channel, in case there is no diplomatic relations between claimant states and launching state, the claim may be presented by another state or through Secretary General of the United Nations.¹⁴³ If no settlement of claim is arrived at through diplomatic negotiations, the parties concerned shall establish a Claims Commission at the request of either party.¹⁴⁴ The claim may also be presented in the courts or administrative tribunals or agencies of a launching state;¹⁴⁵
6. The compensation which the launching state shall be liable to pay for damage shall be determined in accordance with international law and the principles of justice and equity, in order to provide such reparation in respect of the damage;¹⁴⁶
7. In case the damage caused by a space object presents a large-scale danger to human life or seriously interferes with the living conditions of the population, the launching state shall render appropriate and rapid assistance to the state which has suffered the damage;¹⁴⁷
8. This convention shall apply to any international intergovernmental organization which conducts space activities if the organization declares its acceptance of the rights and obligations provided for in this convention.¹⁴⁸

B. The Issues of Interpretation and Implementation of The Liability Convention of 1972

Since the entry into force of the Liability Convention there was a famous case, the re-entry of the former USSR's satellite "Cosmos 954"

¹⁴² Ibid, article VIII.

¹⁴³ Ibid, article IX.

¹⁴⁴ Ibid, article XIV.

¹⁴⁵ Ibid, article XI paragraph 2.

¹⁴⁶ Ibid, article XII.

¹⁴⁷ Ibid, article XXI.

¹⁴⁸ Ibid, article XXII.

in the territory of Canada in 1978. From diplomatic communications between the government of Canada and the government of the former USSR, there were some differences in the interpretation of article XXI of the Liability Convention, namely:

1. In case the activities of a space objects may cause large scale danger, on the one hand the former USSR was in the opinion that the launching state has the rights to determine the party that could render assistance for search and recovery and clean-up operation, while on the other hand Canada was of the opinion that it should be determined by the state which suffers the damage;
2. As a consequence of such interpretations the former USSR insisted that its government should not be held liable for the cost of search and recovery and clean-up operation conducted by the US government upon the request of Canada. The former USSR's government was only willing to pay compensation for physical and direct damage caused by "Cosmos 954".

Apart from the above case, there are some weaknesses in the provisions of the Liability Convention, among others:

1. There is an unfair situation for a state in the launching activities, which only provide territory for lease as it falls into the category of "launching state". Under the Liability Convention such a state should be jointly and severally liable together with the state, which actually launches and the state, which procures the launch for any damage caused by their launching activities. This is unfair since its technical contribution to cause damage is minimum;
2. As the Liability Convention relies on government-to-government mechanism in the settlement of compensation, there is no guarantee for a prompt, effective, and adequate payment of compensation to the victims. So, it is against the victims-oriented character of the Liability Convention itself. Besides, the Liability Convention fails to accommodate and anticipates the fact of increasing participation of private sectors in space activities.

C. Implication towards the Formulation of National Space Legislation

In the formulation of the draft national space act, particularly provisions regarding procedures and mechanism of claim for compensation, the provisions of the Liability Convention will be incorporated which applies to international liability, while it also establishes domestic procedures and mechanism for compensation. The draft also regulates national coordination mechanism in case of possible re-entry of satellite into the territory of Indonesia. Such coordination covers institutional aspects, apparatus, technology preparedness and financing. Considering weaknesses of the Liability Convention, considerations should be taken for the possibility to propose amendment to the Liability Convention to adjust with technological development. The proposal for such amendment covers certain substances, among others:

1. Extending the scope of “recoverable damage” to include the cost of search and recovery and clean-up operation; and also possibly for “indirect damage” and “non-physical damage”;
2. As long as it is feasible, system and mechanism for compensation under the Liability Convention can be broaden (extended) to cover liability for damage caused by launching activities conducted by private entity. This is important in order to guarantee prompt, effective and adequate payment of compensation to the victim;
3. Proposing that the decision of the Claim Commission shall be final and binding upon the conflicting parties;
4. The formulation of “international cooperation in case of large scale danger” shall be made clear in order to prevent ambiguity;
5. Regarding apportionment of liability in the joint launching, arrangement should be made among the parties that the portion of liability shall be weighed upon the state which actually launch, since it theoretically pose the biggest contribution to the failure of the mission.

V. THE REGISTRATION CONVENTION OF 1975

A. Basic Provisions

The Convention on Registration of Object Launched into Outer Space of 1968 elaborates the provision of article VIII of the Space Treaty of 1967. These conventions consist of 12 articles and provide provisions, among others:

1. Terminologies and definitions, such as: “launching state”, “space object” and “state of registry”.¹⁴⁹
2. The obligation of the launching state to register object launched into outer space in an appropriate registry which it shall maintain and shall inform the Secretary general of the United Nations of the establishment of such a registry.¹⁵⁰
3. In a joint launching, the parties shall jointly determine which one of them shall register the object.¹⁵¹
4. The Secretary General of the United Nations shall maintain a register in which the information furnished in accordance with article IV shall be recorded. There shall be full and open access to this information in this register.¹⁵²
5. Information to be furnished by state of registry shall include: name of launching state; appropriate designator of the space object or its registration number; date and territory or location of launch; basic orbital parameter including nodal period, apogee and perigee; general function of the space object; periodical information concerning the object; and information regarding inactive satellite.¹⁵³
6. International cooperation to render assistance to identify a space object may cause damage or may be of a hazardous or deleterious nature.¹⁵⁴

¹⁴⁹ See Registration Convention, article I.

¹⁵⁰ Ibid, article II paragraph 1.

¹⁵¹ Ibid, article II paragraph 2.

¹⁵² Ibid, article III.

¹⁵³ Ibid, article IV.

¹⁵⁴ See Ibid, article VI.

7. Applicability of the convention to intergovernmental organization, which conducts space activities if the organization declares its acceptance of the rights and obligations provided for in the convention.¹⁵⁵

B. The Issues of Interpretation and Implementation of the Registration Convention of 1968

In the process of creating a national registration system for space activities, it should take into considerations how the contracting parties interpret and implement it, which can be described as follows:

1. The facts that only 10 (ten) states and 2 (two) intergovernmental have registered their space objects under the Registration Convention, even 5 (five) of them are not contracting parties to the Registration Convention, instead they registered in accordance with UNGA Resolution no 1721 of 1961;
2. The facts that registration marking is not obligatory under the Registration Convention could raise difficulties in identifying the space objects;
3. In general, states do not register their space objects if it is launched for military missions or classified as sensitive satellite;
4. So far, no law enforcement mechanism exists for the issues of non-compliance to the Registration Convention;
5. To prevent double registration certain country determines not to register foreign satellites;
6. The facts that the development of commercialization and privatization of space activities is not entirely accommodated by the Registration Convention unless flexible interpretation to its provisions can be conducted.

C. Implication towards the Formulation of National Space Legislation

By taking into account international obligations of Indonesia under the Registration Convention, the national interests, and further

¹⁵⁵ Ibid, article VII.

considerations of interpretation and implementation of the convention by other countries, formulation of national legislation will be directed towards:

1. Developing a national registration system for space activities for the purpose of identifying any Indonesian space objects and providing information in accordance with mechanism of Registration Convention;
2. Exercising jurisdiction and control over space objects registered in Indonesia;
3. Regulation concerning transfer of registry in the event of transfer of ownership over the space object;
4. Regulation concerning determination of state of registry in joint launching activities;
5. Determination of a national body in charge of coordinating national registration system.

VI. THE MOON AGREEMENT OF 1979

Despite the fact that Indonesia has not ratified the Moon Agreement, some provisions of the Moon Agreement shall be taken into considerations when formulating national space act, namely:

- A. The intention to establish an international regime for exploitation of natural resources of the moon as “common heritage of mankind” can be a good model for managing other space resources;
- B. An elaboration of “common heritage of mankind” would further clarify the interpretation of “non-appropriation” principle;
- C. The expressed formulation in the Moon Agreement that activities on the moon shall be exclusively for peaceful is reflecting a strong political will of the international community to guarantee peaceful exploration and exploitation of the moon and its resources.

With respect to the perceptions of different countries towards the Moon Agreement can be described as follows:

- A. Only 10 (ten) countries ratified the Moon Agreement.
- B. The US has shown its reluctance to ratify the Moon Agreement as it perceives that the provisions of article XI of the Moon Agreement is very controversial since interpretation of “common heritage of mankind” as formulated in that article is deemed as a disincentive to development. Besides, application of provisions concerning orderly development and equitable sharing can be treated as imposing taxes at the benefits of countries, which put at no risk (developing countries). It was added that the Moon Agreement impose moratorium for exploitation of natural resources of the moon.¹⁵⁶
- C. In the latest development, The US and Australia propose that regulation concerning natural resources of the moon shall be regulated by national law of any country, the proposal was opposed by Italy, the Netherlands and Canada.¹⁵⁷

From the perspectives of the Indonesian interests there is no such urgency to ratify the Moon Agreement, although the elaboration of common heritage of mankind shall be further examined and observed.

VII. OTHER RELEVANT INTERNATIONAL TREATIES

Apart from the existing international space treaties, there are relevant international treaties that shall be taken into account in formulating the draft of national space act, namely:

1. The ITU Constitution and Convention of 1992 and its Amendments, including Administrative Regulations;
2. Treaty Banning Nuclear Weapons Test on the Surface of the Earth, in the Atmosphere or in Outer Space of 1963;
3. The Treaty on the Non-Proliferation of Nuclear Weapon of 1968;

¹⁵⁶ For further analysis on this issue see Glenn Harland Reynolds, “The Moon Treaty: Prospect for the Future”, in *Space Policy*, May 1995, page 17. See also Martin Mentor, “Commercial Space Activities Under the Moon Treaty”, *Proceeding of the IISL’s Colloquium*, 1980, page 37.

¹⁵⁷ This debate has colored the UN/ Korea Workshop on Space Law, Daejeon, Korea, 3-6, November 2003.

4. The arrangement among the group of developed countries regarding “Missile Technology Control Regime” (MTCR).

VIII. CONCLUDING REMARKS

To conclude my presentation some remarks can be addressed:

1. For the purpose of formulating national space legislation, particularly the draft of national space act in Indonesia, as long as it is possible and in line with the national interests, principles and provisions of the international space treaties and other relevant international treaties in which Indonesia is a contracting party, shall be integrated into the draft national space act.
2. The efforts to integrate the existing international space treaties and other relevant international treaties shall pay attention to the dynamic of national interests and the recent trends and development in international sphere, particularly concerning interpretation and implementation by other countries to the relevant treaties.
3. Regarding international treaties of which Indonesia is not a party, the relevant provisions shall be seriously considered as long as in line with the national interests.
4. The formulation of national space legislation shall also take into considerations of trends and development space activities, including the trends of commercialization and privatization of space activities.

4

THE COMMERCIALIZATION OF SPACE ACTIVITIES: CHALLENGES AND OPPORTUNITIES FOR DEVELOPING COUNTRIES^{*}

ABSTRACT

The speedy growth of commercialization of space activities will have its impacts toward developing countries. On one part, it will raise new opportunities for them, but on the other hand it will also possess some challenges. This paper is aimed at identifying and analyzing such challenges and opportunities in order to optimize the benefit from commercialization of space activities to the interest of developing countries, particularly its access to such development.

I. INTRODUCTION

In the last few years, we can observe a tremendous growth of commercialization of space activities in many fields, such as telecommunication, remote sensing, space transportation etc. There are some factors, which contribute to such development:

A. **Fundamental changes in the world politics**

Fundamental change in the world politics, especially in East Europe has practically ended the 4 (four) decades cold war era. The consequences

^{*} Presented at United Nations/Indonesia Regional Conference on Space Science and Technology for Sustainable Development, Bandung, 1993

of this situation, is the decreasing of military oriented space activities. In return, more attention has been paid to convert military oriented space activities into civil/commercial space activities. A good example of this tendency can be seen in Russia, where the Russian has encouraged its efforts to offer/sell its high-technology space activities to its western counterparts.

B. The changes in the framework/modes of industry within industrialized countries

With the emergence of New Industrialized Countries (NIC's) in conventional industry, it seems that more industrialized countries are concentrating their international trade to trade in high-technology, including space related technology.

C. The Increasing demands of space goods and services

Several space related technology such as telecommunication, remote sensing, and space transportation is mostly needed by developing countries to speed up acceleration of their development.

D. The changes in the general pattern of economic policy

The world's globalization has influenced the pattern of economic policy of many countries. Liberalization of economic policy and the lift up of monopoly has become a must. Certain sectors, which at the present time are under governmental hand, have been gradually transferred to private sectors. At the same time, new deregulation policy has been applied which promote competition.

E. Achievement in the field of space science and technology

After more than 3 (three) decades of human ventures into outer space, some new technological inventions have been achieved, including space technology for practical purposes. New inventions in space science and technology may reduce the cost to a minimum price, this will such technology to fulfill practical needs.

F. Human efforts to seek for new resource of alternative energy

As the result of over exploitation of natural resource and energy of the earth, it has caused a dramatic decrease of natural resource reserve.

Based on this fact, there is a need to seek for new alternative energy to prevent energy crisis in the future. In fact, new natural resource and alternative energy has been found either on the moon or asteroid.

G. The increasing demands of human consumption

As the logical consequence of the promotion of human civilization, the needs to fulfill its consumption needs has also been increasing, including the benefit from the development in the field of space science and technology.

As an illustration to show the speedy growth of commercial space activities, it can be noted that the commercial space sectors grew at about 3.6% in 1991. It includes communications satellites sale, transponder leasing, and fixed ground space activities. Meanwhile, EUTELSAT announce a 20% increase in their income from satellite operations in 1990. Furthermore, the Center for Space Policy in Cambridge, Massachusetts, has predicted that the whole sector of space activities at the end of this century will absorb US \$ 16,8 - 51,5 billion per year, with the breakdown as follows:

- US \$ 2 - 7,9 billion in space manufacturing,
- US \$ 8,8 - 15,3 billion for telecommunication satellite industry,
- US \$ 558 - 2,8 billion for orbital services,
- US \$ 240 million - 2,4 billion for space transportation sectors, and
- US\$ 4 - 10,4 billion for ground support.

The great prospects of business in space, as shown above, will attract participation into these ventures not only by states and international organizations, but also by private entities.

II. CHALLENGES AND OPPORTUNITIES FOR DEVELOPING COUNTRIES

Commercialization of space activities will bring more challenges and opportunities, either to developed countries or developing countries. Among developing countries, there are some concerns that commercialization will:

- Bring increases in launch costs for developing countries whether they use private or governmental launchers;
- Lead to foreign domination in developing countries' telecommunications;
- Increase the costs for launch insurance;
- Increase the costs for un-enhanced or value added data;
- Concentrate commercial companies' attention on the stronger developing countries' business and urban market, while neglecting rural or remote areas;
- Increase cultural alienation and adoption of foreign values; and
- Mean the end of open and non-discriminatory access to data, the very policy they argued forcefully against for so many years.

These concerns will be worsened by common weaknesses on the part of developing countries that might become obstacles to their participation in space activities, such as:

- lack of funding;
- lack of information/communication flow to developing countries;
- lack of experienced technical/scientific personnel;
- political and socio-economic tensions between developed and developing countries;
- lack of sufficient scientific infra-structure;
- the difficulty of getting good data early.

Meanwhile, there is optimism that commercialization of space activities will bring greater opportunity and benefits for developing countries, commercialization, if it succeeds, will dramatically restructure the market for space launch and missile technology, and the biggest beneficiaries will be in the third world.

In addition, many developing countries and less developed countries have found, for example, that INTELSAT, which operated on a commercial basis, can become a way of overcoming intense topographic and other

barriers to the establishment of satisfactory internal telecommunications within their territories. They also have found INTELSAT circuits a cost-effective answer to their domestic telecommunication needs. INTELSAT has had an assistance and development program for some years. It has been expanded by the creation of a development fund that provides technical assistance, training and help in arranging financing for communication development projects.

Commercialization will also lead to opportunities that would help the development process in developing countries. One private firm, Pan American Satellite Cooperation (PANAMSAT) for example, which offers services to Latin America, plans to have high powered spot beams especially designed to facilitate receipt of signals by small earth stations. Other firms will probably offer innovations, which are especially helpful for rural development.

In the field of financing, some United States banks for example, have helped to finance some developing countries domestic satellite such as Brazil, India, Indonesia and Mexico, and regional satellite systems such as ARABSAT and the South Pacific System.

III. THE PROMOTION OF OPPORTUNITIES FOR DEVELOPING COUNTRIES IN THE COMMERCIALIZATION OF SPACE ACTIVITIES, ESPECIALLY THE GUARANTEE OF THEIR ACCESS RIGHTS

From the illustration above, it appears that what is important to be considered is how to promote that commercialization could bring more opportunities and benefits for developing countries, while minimizing its negative impacts. Commercialization should also encourage participation by private sectors, either in developed or developing countries, and to improve the welfare and prosperity of mankind. For that purpose, an international mechanism, which guarantees access rights of developing countries, will become essential.

As we can observe, the development and application of space science and technology so far, are mostly for the benefit and in the interest of all countries, particularly those of developed countries. Although all states

are legally equal, developing or third world countries are at a definite disadvantage in their political and legal dealings with developed countries. They lack of economic, military power and technology that are needed to negotiate on an equal basis. This will influence its position, especially with regard to its access to:

A. Access to taking of benefits from natural resources in outer space, including the moon and other celestial bodies

In ensuring access of developing countries to natural resources in outer space, including the moon and other celestial bodies, the development concerning the regulation of geostationary orbits in the framework of the International Telecommunication Union in its series of World Administrative Radio Conferences, can be deemed a good example for finding solutions to these conflicting interests. On such a conference, **MILTON L SMITH** wrote as follows: *“space WARC was therefore, a historic event in telecommunications. This conference was relatively successful resolution of very complex technical issues that were embodied in a highly political subject. The space WARC was called for in 1979 as a result of a clamoring by developing countries that had begun years before. Moreover, this action was part of an overall movement by developing countries to seek access to, and benefit from international common resources of the seabed and the moon. This movement extended to the geostationary orbit, the most commercially important area of outer space, is not surprising. This is particularly so given the overall importance of the telecommunication satellite operation from the geostationary orbit. Moreover, the concerns of developing countries regarding their future access to the orbit/spectrum resource were understandable in light of increasingly intensive use being made of that resource by developed countries”*.

In the process of establishing rules governing the use of geostationary orbit, it was clear that developing countries, sponsored by some equatorial countries, have played an important role. On the claim to the geostationary orbit as stated in Bogotá Declaration of 1976, **PRIYATNA ABDURRASYID** rightly said as follows: *“Basically,*

it has turned out that the Bogotá declaration adopted by the Equatorial Nations in 1976 has become one of the prime movers for a comprehensive review by the international community with regard to utilization of the geostationary orbit for various purposes. Although the declaration has come up in the shape of a demand launched by the equatorial countries, claiming their sovereignty over the geostationary orbit which is situated above their respective territories, it has turned out that its development in the international arena has come to nothing but a more protest against the procedures regulating the utilization of the geostationary orbit under the principle of first come, first served”.

The assessment as stated above showed the contribution of developing countries to existing space law in general, and especially to the regulation governing the use of geostationary orbit.

In ensuring the access of developing countries to the future commercial utilization of outer space, including the moon and other celestial bodies, some legal concepts laid down in the existing space treaties should be clarified, such as:

1. **The Common Heritage of Mankind (CHM)**

The concept of the common heritage of mankind is a new concept in space law, which is introduced by Article XI of the Moon Treaty, which declares natural resources on the moon and other celestial bodies to be the common heritage of mankind. On the interpretation of this concept, there is still no consensus. CARL Q CHRISTOL states it as follows: *“The search for a unitary approach to the meaning of CHM is doomed to frustration”. Few would willingly to impose a single meaning on such legal principles as property, possession, due process of law or the equal protection of the law.* “

This view is also supported by **HOSSENBAL** by saying: *“I don’t think the CHM is a defined term, and I think people are overly concerned with the definition. It would be impossible to come up with the definition in a space context”.*

Although there is still no formal definition on such legal concept, at the International Law Association (ILA) Conference

in Montreal in 1982, the basic features and principles of CHM have been identified, such as:

1. Non-appropriation of the area and of its natural resources;
2. Sharing of benefits among all;
3. Protection of the physical environment and the conservation of natural resources, bearing in mind future generation as well;
4. An organizational framework for mankind including a system of management; and
5. Uses for peaceful purposes.

Meanwhile, during the formulation of the United Nations Convention on the Law of the Sea which was signed in Montego Bay in 1982, the government of Malta stated that the concept of CHM had 5 (five) basic implications:

1. The CHM cannot be appropriated, it could be used but not owned;
2. The used of CHM required a system of management in which all users must share;
3. It implied an active sharing of benefits including not only financial benefits derived from shared management and exchange and transfer of technologies;
4. The principle of CHM implied eventual reservation for peaceful programs; and
5. It implied transmission of the heritage substantially unimpaired to future generations.

Some representative from developed countries have expressed their concern about the interpretation of CHM on the draft treaty on the Law of the Sea which in their opinion did not conform to the national interest of countries with free enterprise/free market economies, particularly as they related to such matters as production limitation, technology transfer, dispute settlement and competition.

From developing countries' perspective, what is more important in the interpretation of this concept is that it should guarantee access rights of developing countries to such natural resources. For that purpose, certain mechanism should be created under the supervision of an international body, which should also include a mechanism for its enforcement.

2. **The Non-Appropriation Principle**

The principle of non-appropriation as it is stated by Article 2 of the Space Treaty of 1967 and Article XI part 2 of the Moon Treaty of 1979 is a very important principle with regard to access rights of developing countries to the natural resources on the moon and other celestial bodies. As commonly understood, this provision forbids any formal claim of territorial sovereignty over parts of outer space, including the moon and other celestial bodies.

On this principle, **MARCOFF** pointed out that states could exercise exclusive rights over celestial bodies or parts of them without explicitly claiming territorial sovereignty. Therefore in his opinion, the prohibition of national appropriation also comprises variations of exclusive competence that do not fall in the category of "sovereignty".

The scope of interpretation of the non-appropriation principle also raises different opinion among scholars; some of them are of the opinion that the use of an individual satellite slot of the geostationary orbit for more than 30 years can be deemed as violation of this principle, while others question whether utilization of space is possible without proportion at all.

Concerning the meaning of non-appropriation principle as stated in Article XI of the Moon Treaty, it refers to prohibition ownership; neither the surface nor the subsurface of the moon, nor any parts thereof or natural resources in place, shall become property of any state, international intergovernmental or non-governmental entity or of any natural person.

Whatever the interpretation thereof would be, it should be born in mind that it should prevent any kind of monopoly, which merely based on the technical and financial capability of a country. This practice will only be for the benefit of developed countries while neglecting the needs and interests of the late arrivals (developing countries).

B. Access to the benefits from the development in space science and technology

As it is generally recognized, the progress in space science and technology has brought improvements to human life, and people are enjoying these benefits in many fields of human activities. But, as we can also observe, developed countries mostly enjoy these. In the field of communication for example, according to report of the Maitland Commission, of the 600 million telephones in the world, three quarter are concentrated in nine (9) countries. The remainders are distributed unevenly throughout the world. While telecommunication is taken for granted as a key factor in economic, commercial, social and cultural activity in industrialized countries, and are considered as an instrument for growth, in most developing countries systems are not adequate even to sustain essential telephone services. In many areas, there is no service at all. The commission asserted furthermore that neither in the name of humanity, nor on grounds of common interest, such a disparity is acceptable. Three quarter of the world's population live in countries with ten telephones or less than one for every 100 persons, over half live-in countries with less than one telephone for every 100 persons.

The inequality as shown by those data above was caused by the incapability of most developing countries to procure such a kind of technology, which is very expensive according to their standards. To overcome this problem, there is a need to develop a cooperation mechanism in the international sphere, either between developed and developing countries, or among developing countries themselves. The question is whether such international cooperation is obligatory under

existing space law? This legal question should be clarified for further development of future space law, especially with regard to commercial utilization of outer space.

The other question is related to the application of the non-discrimination principle in order to assure that developing countries will get access to benefits derived from progress in the field of space science and technology. This non-discrimination principle is not only limited to race, political, ideological, or religious considerations, but also to their financial capability. Therefore, considerations should also be directed toward the possibility of rendering facilities or offering lower price or even preferential treatment of developing countries with the priority to encourage their development.

C. Access to space science and technology

As we already know, most of technological capabilities are in the hands of developed countries, including space science and technology. In order to encourage developing countries to develop their technical capabilities, there is a need for transfer of technology from developed countries to developing countries. But, in fact, the space powers do not give developing countries access to space science and technology because of its military potentials. According to this policy, the space powers provide technology assistance to developing countries normally on a reimbursable basis, furnishing launch and other services, such as engineering assistance and certain hardware, but a true transfer of know-how does not take place. For instance, according to NASA policies, cooperative agreements are designed to avoid leakage of critical technology. Thus, prior to entering into a proposed cooperative undertaking, NASA is assured that the cooperating partner has the financial resources and it has a demonstrated technical capability to carry out its own responsibility, so that the export from US sensitive advance space technology is minimized. Sometimes restrictions on the use or transfer of technology are also based on political grounds. In addition, the application of MTCR (Missile Technology Control Regime) to a certain extent

may hamper developing countries in entering international market in the future.

To provide developing countries access to space science and technology, there is a need for some change to the present situation. For that purpose, the establishment of certain mechanisms for the transfer of technology will become necessary. This should be supported by close cooperation between developed and developing countries. Fruitful cooperation will provide mutual benefits for both sides. On one hand, it will help developing countries to accelerate their development; on the other hand, developed countries will get more opportunity to expand the market for their products. When it is necessary, in order to prevent such technology from being abused, which could endanger international peace and security, some restrictions and conditions may be imposed. But these should not be used as a legal basis to hamper the general policy on transfer of technology to developing countries.

On the scope of transfer of technology, it is worth to note **CHARLES W LINDSEY's** statement as follows: *"...the transfer of technology is not only the transfer of technology across national boundaries, but also its control"*. Although its realization will be difficult, a true transfer of technology should fulfill such criterion.

Meanwhile in the New International Economic Order's (NIEO) framework, more emphasis has been directed towards transfer of "technology know-how" and the technology to process raw materials for improving the prosperity of developing countries. Further, the need was stated for: *"Giving to developing countries access to the achievement of modern science and technology, and promoting the transfer of technology and the creation of indigenous technology for the benefit of developing countries in forms and in accordance with procedures which are suitable to their economic"*.

Those concepts of transfer of technology should be taken into consideration in the process of transfer of technology in space science and technology to developing countries.

D. Access to enter the international market

In the last few years, we can observe that in several fields of space activities, certain developing countries such as the People's Republic of China have shown tremendous progress, especially in the field of space transportation. The Chinese satellite launcher "Long March" for example, has proven ability to compete with other competitors from the United States, Western Europe and The Soviet Union.

This has been mainly made possible by its low (especially labor) costs, which enable it to offer its services for considerably lower price compared with other launch providers. This has resulted in growing concerns among Western countries such as the United States and some European Countries. Therefore, in order to prevent the Chinese competitor, the United States for example, has forced China to sign an agreement with the United States Government regarding "International Trade in Commercial Launch Services" in January 1989. According to this agreement, China was only allowed to launch 9 (nine) western commercial communications satellites in a six years' period that will end in 1994. Besides, the United States may impose its Export Control Act to prevent satellites or its component parts to be launched by the Chinese launchers. Some Western European Countries also took similar actions against China in entering the International market.

These kinds of protectionist act will of course hamper access of developing countries to enter the international market. The legal questions, which may arise from that illustration, are whether these acts can still be deemed fair competition in the international market or not. Can China also be deemed to conduct dumping policy by offering lower prices? Are there any criteria to calculate "true costs"? Can the principles of General Agreement on Tariff and Trade (GATT) be applied to international trade in high technology and trade in services? Can developing countries be granted a kind of Most Favored Nations (MFN) clause to assist them in entering the international market?

The answer to these legal questions will be useful as considerations in the legal formulation of the framework for commercial utilization of outer space.

IV. CONCLUDING REMARKS

- A. As commercial utilization of outer space shows good prospects, immediate improvements to existing international and space law have become necessary in order to guarantee that such activities can be conducted in a fair, just and orderly manner. These improvements should also include anticipation of all possible legal problems, which may arise from future commercial activities in space.
- B. In order to promote opportunities for developing countries with regard to commercialization of space activities, especially for its access rights a workable international mechanism should be established within the United Nations' framework. For that purpose, international cooperation either in the global.

**PRELIMINARY DRAFT OF SPACE
PROTOCOL: COMMERCIAL OPPORTUNITIES
AND CHALLENGES FOR DEVELOPING
COUNTRIES***

I. INTRODUCTION

In Cape Town in the year of 2001 “Convention on International Interests in Mobile Equipment was signed. The Convention contain common rules for the creation, registration, priority and enforcement of security interests in specific types of expensive/high value mobile objects namely air frames, engines and helicopter, railway rolling stock, and space objects. The Convention addresses some important issues, covering:

- A. Secure financing of expensive mobile equipment;
- B. Applicable law;
- C. Existence and applicability of rights;
- D. Legal certainty in higher cost financing.

In principle, the Convention lays down provisions which protect the interest of international interest holder in case of bankruptcy or default on the part of debtor/lessee. In such situation, the Convention provides basic remedies to:

* Sattelite Newsletter, 2004

- take possession or control of object;
- sell or lease object;
- receive income or profits from use of object

The Convention has entered into force on April 1st, 2004 after the submission of 8 instrument of ratification.

By itself the Convention does not apply to anything. It requires a Protocol to apply to the rules in the Convention to a particular class of object. The first Protocol to be agreed was the Aircraft Protocol which was also sign in Cape Town. There are further two (2) Protocols which are being negotiated, the Railway Protocol for Railway Rolling Stock and the Space Protocol for Space Objects.

II. THE PRELIMINARY DRAFT OF SPACE PROTOCOL

As far as space objects are concerned, a Preliminary Draft Protocol has been prepared and discussed by UNIDROIT (The International Institute for Unification of Private Law), an organization based in Rome, Italy. The First Draft was prepared by the Space Working Group and revised by A UNIDROIT Steering and Revisions Committee and further considered by a UNIDROIT Committee of Governmental Experts from 15 to 19 December of 2003. In April 2004, a Colloquium was jointly held by the UNIDROIT Space Working Group and the Malaysian Space Agency in Kuala Lumpur to discuss the latest draft. The Preliminary Draft Protocol is designed to create a new international regimen for the taking of security in space asset and thus to facilitate conditions for access to commercial space financing.

III. CONTROVERSIAL ISSUES CONCERNING PRELIMINARY DRAFT OF SPACE PROTOCOL

A. Definition of Space Asset

In article 1 (2) (g) of the Preliminary Draft of Space Protocol, “Space Asset” is defined as:

- “any identifiable asset that is intended to be launched and placed in space or that is space;
- any identifiable asset assembled or manufactured in space;
- any identifiable launch vehicle that is expendable or can be re-used to transport person or goods to and from space”

While on the one hand the definition of “Space Asset” is broader than “Space objects” as defined by the existing Space Treaties and Conventions since “Space Asset” is not only cover “tangible asset” but also “intangible asset” (such as “associated rights” or “related rights”), on the other hand it confined to certain technology (for example: launch vehicle). The definition of “Space Asset” only cover “space segment” while “ground segment” is not included. This is inconsistency with the fact that financing for space activities is covering “ground segment”.

B. The Exercise of Remedies

The exercise of “Remedies” under the Draft Protocol may create problems as “the interests’ holder” may not only take possession or control over the asset but also other “related rights” such as: licenses, frequency, and orbital slot. Moreover, the taking over of such possession and control may hamper the public interest of the country where the debtor is incorporated or domiciled. There was therefore suspicion from some developing countries that there is a “hidden agenda” behind the initiative to formulate the Draft Space Protocol which could lead to a situation where the space activities of “developing countries” will be fully controlled by the ‘developed countries’. At the end, it may derogate the sovereignty of “developing countries”.

Some practical issues may also arise regarding the conflicting interest of different creditors (Interests holders) to space asset in the event that it subject to two (2) or more separate registered interests.

C. Registraar & Supervisory Authority

Under the Draft Space Protocol a Registraar will be assigned to operate the 24 hours-electronic public-notice based registry of:

- international interest and prospective international interest;
- assignment of international interest;
- subordination of international interest;
- contracting-parties' declaration on opt-in/opt out provision;
- declaration of non-consensual rights and interest and other registrable interest.

The above registration confers priority rights to registered interest which override other interest. The registraar can be a public or private entity.

To supervise the activities of the Registraar, a Supervisory Authority will be set up with the competences to dismiss the registraar, approve rules and set fees. During the Legal Sub Committee Session of the UNCOPUOS (United Nations Committee on the Peaceful Uses of Outer Space) in 2004 it was in principle agreed that the UN Office of Outer Space Affairs (OOSA) to be assigned as secretariat of the Supervisory Authority. As UN OOSA is under the Secretariat General of the UN there are some questions whether it is appropriate to assign OOSA as there is no such precedence that it acts as supervisor to the activities of private entity (registraar). Besides the liability issues which may arise in such activities may also create a problematic situation to the OOSA. Some delegates are of the opinion that the ITU (International Telecommunication Union) could also be considered to act as Supervisory Authority due to its experiences in dealing with space activities.

IV. IMPLICATIONS OF THE DRAFT SPACE PROTOCOL TO THE INTERESTS OF DEVELOPING COUNTRIES, PARTICULARLY THE NATIONAL INTEREST OF INDONESIA

According to the time frame as set up by the UNIDROIT it is expected that a diplomatic conference can be held in the year of 2005 to discuss the Draft Protocol. It is further expected that the Draft Space Protocol can be agreed by the year of 2006. From the perspective of developing countries,

on the one hand it can be seen that the Draft Space Protocol will lay down favorable legal infrastructure which could attract foreign creditors to provide financing scheme for their space ventures. From this perspective, it opens more access to space and may further create commercial opportunities. On the other hand, it may also create certain consequences of which their space activities might be controlled by other countries which would be of disadvantage to the sustainability of their space programs.

As an archipelagic State with specific geographical situation, Indonesia is absolutely relying on space science and technology and its application. Thus, Indonesia has a great interest and must pay a serious attention to the negotiating process of the Preliminary Draft Space Protocol since it may affect our national interest. It is therefore recommended that an inter-departmental team together with the private sectors and space related stakeholders should conduct a thorough study to this Preliminary Draft Protocol in order to make assessment to its possible implications to the interest of Indonesia.

6

COMMERCIAL UTILIZATION OF OUTER SPACE AND ITS LEGAL FORMULATION DEVELOPING COUNTRIES PERSPECTIVES^{*}

ABSTRACT

In line with the promising prospects of commercial utilization of outer space, some legal question may arise, including whether existing international law and space law and its legal formulation have taken into account the needs and interests of all countries, particularly those of developing countries. The present situation shows that the development in space science and technology are mostly for the benefits and the interests of developed countries, while developing are in a disadvantage situation where they only get a limited access to such benefits. This paper is aimed at exploring some possible legal solutions to guarantee access of developing countries from the commercial utilization of outer space. It will cover access to natural resources in outer space, including the moon and other celestial bodies; access to the benefits derived from the development in space science and technology; access to the space science and technology itself; and access to enter the international market. The challenges and opportunities of commercialization utilization of outer space to developing countries will also be examined.

^{*} Proceedings of the 'Thirty-Fourth Colloquium on The Law of Outer Space, International Astronautical Federation', Montreal, Canada, 1991

I. PROSPECTS OF COMMERCIAL UTILIZATION OF OUTER SPACE

More than three decades after the first successful human mission into outer space, we can observe that mankind's activities have entered into a new phase, that of the commercial utilization of outer space. This is highlighted by the trends of commercialization in various fields of space activities, i.e.: space transportation; telecommunication; remote sensing; space manufacturing, etc.

To show the prospects of commercial space activities, in the United States for example, commercial space sector grew at about 3,6% in 1991. It is estimated that the United States revenues from commercial space activities will reach US\$ 3,6 billion, including US\$ 900 million in communication satellites sales; US\$ 850 million in transponder leasing; and US\$ 1 billion in fixed ground station activities. It is also said that the United States satellite-builders have won the contracts for 49 of the whole 81 satellites under order in 1991, and control 62% of the world commercial satellites market.¹⁵⁸

The financial figures of the French launch company, Arianespace, in 1990 showed an increase in several different section, net sales increased to 3,379 billion Francs (US\$ 663,2 million); firm launch contracts grew from 24,5 billion Francs (US\$ 4,08 billion) in 1989 to 31,8 billion francs (US\$ 5,3 billion); new launch orders more than double from 7 in 1989 to 15 in 1990.¹⁵⁹ Meanwhile, the 28-nation European Telecommunication Satellites Organization (EUTELSAT) of Paris announced a 20% increase in income from satellite operation in 1990. Income in 1990 totaled 122 million European Currency Unit (ECU) equal with US \$ 143 million, compared to 99 million ECU (US\$ 116 million) in 1989. Profits totaled 14,1 million ECU (US\$ 16,5 million). Transponder rental to television and radio broadcasters account for 70% of EUTELSAT'S revenues, generating 85 million ECU (US\$ 99,8 million) in 1990. Income produced from transponder rental for telephone purposes accounted for 24 million

¹⁵⁸ Space News, 8 – 14 July, 1991

¹⁵⁹ Space News, June 24 – 7 July, 1991

ECU (US\$ 28 million), and transponder dedicated to the business communications accounted for 12 million ECU (US\$ 15 million).¹⁶⁰

Furthermore, the Center for Space Policy in Cambridge, Massachusetts, has predicated that the whole sector of space activities at the end of this century will absorb US\$ 16,8-51,3 billion per year, with the breakdown in figures as follows:

- US\$ 2 - 17,9 billion in space manufacturing,
- US\$ 8,8 - 15,3 billion for telecommunication satellites industry,
- US\$ 558 million – 2,8 billion for orbital services,
- US\$ 240 million – 2,4 billion for space transportation sectors, and
- US\$ 4 – 10 billion for ground support.

The great prospects of business in space, as shown above, will attract participation into these ventures not only by states and intergovernmental organizations, but also by private entities. Consequently, there will be more competition in every field of space activities. These requires further regulations, either domestic or international, in order to maximize their benefits to humankind.

II. ACCESS OF DEVELOPING COUNTRIES

The prospects of commercialization in various fields of space activities as have been described above, concerned only parts of the whole range of possible activities. Other fields of activities will follow. From the legal point of view, the problem is whether the existing body of space law will be able to cover possible legal problems, which may arise from commercial space activities? And also, whether existing space law and its process of legal formulation have taken into account the needs and interests of all countries, particularly those of developing countries. Why these questions should be raised, since as we can observe, the development and application of space science and technology so far, are mostly for the benefit and interest of developed countries. Although all states are legally equal, developing

¹⁶⁰ Space News, 7 – 23 June, 1991

or third world countries at a definite disadvantage in their political and legal dealings with developed countries. They lack economic, military power and technology that are needed to negotiate on an equal basis.¹⁶¹ Developing countries have vigorously participated in the United Nations, such as working papers, draft resolution, and draft treaties, and their contributions have considerable merits. Nevertheless, developing countries lack the ultimate authority of decision making about space matters, either individually or as a group.¹⁶²

In the developing process of commercial utilization of outer space, especially in its legal formulation, what is important to be taken into account is the needs to ensure access for developing countries. Access for developing countries in its broadest meaning will include:

A. Access to the taking of benefits from natural resources in outer space, including the moon and other celestial bodies

In ensuring access of developing countries to the natural resources in outer space, including the moon and other celestial bodies, the development concerning the regulation of geostationary orbits in the framework of the international telecommunication union in its series of World Administrative Radio Conferences, can be deemed a good example for finding solutions to these conflicting interests. On such a conference, MILTON L SMITH, wrote as follows:¹⁶³

“The Space WARC was therefore, a historic event in telecommunications. This conference was relatively successful resolution of very complex technical issues that were embodied in a highly political subject. The Space WARC was called for in 1979 as a result of a clamoring by developing countries that had begun years before. Moreover, this action was part of an overall movement by developing countries to seek access to, and benefit

¹⁶¹ Myers, David S, “Third World Participation in Space Law Development”, Proc. Colloquium on the Law of Outer Space p.130 (1988).

¹⁶² Ibid

¹⁶³ Smith, Milton L, “A New Era for the International Regulation of Satellite Communications”, XIV, Annals of Air and Space Law. P.449 (1989)

from international common resources of the seabed and the moon. That this movement extended to the geostationary orbit, the most commercially important area of outer space, is not surprising. This is particularly so given the overall importance of telecommunication satellite operating from the geostationary orbit. Moreover, the concerns of developing countries regarding their future access to the orbit/spectrum resource were understandable in light of increasingly intensive use being made of that resource by developed countries”.

In the process of establishing rules governing the use of geostationary orbit, it was clear that developing countries, sponsored by some equatorial countries, have play an important role. On the claims to the geostationary orbit as stated in the Bogota Declaration of 1976, PRIYATNA ABDURRASYID rightly said as follows:¹⁶⁴

“Basically, it has turned out that the Bogota Declaration adopted by the Equatorial Nations in 1976 has become one of the prime movers for a comprehensive review by the international community with regard to utilization of the geostationary orbit for various purposes. Although the Declaration of the geostationary orbit for various purposes has come up in the shape of a demand launched by the Equatorial countries, claiming their sovereignty over the geostationary orbit which is situated above their respective territories, it has turned out that its development in the international arena has come to nothing but a mere protest against the procedures regulating the utilization of the geostationary orbit under the principle of first come, first served.”

The assessment as stated above showed the contribution of developing countries to existing space law in general, and especially to the regulation governing the use of geostationary orbit.

In ensuring the access of developing countries to the future commercial utilization of outer space, including the moon and other

¹⁶⁴ Abdurrasyid, Priyatna, “Developing Countries and Use of Geostationary Orbit”, Proc. Colloquium on the Law of Outer Space, p.377 (1987).

celestial bodies, some legal concepts laid down in the existing space treaties should be clarified, such as:

1. **The Common Heritage of Mankind (CHM)**

The concept of the common heritage of mankind is a new concept in space law, which is introduced by Article XI of the Moon Treaty, which declares natural resources on the moon and other celestial bodies to be the common heritage of mankind. On the interpretation of this concept, there still is no consensus. As it is stated by CARL Q CHRISTOL as follows:¹⁶⁵

“The search for a unitary approach to the meaning of CHM is doomed to frustration. Few would willingly to impose a single meaning on such legal principles as property, possession, due process of law or the equal protection of the laws”

This view is also supported by HOSSENBAL by saying:¹⁶⁶

“I don’t think the CHM is a defined term, and I think people are overly concerned with the definition. It would be impossible to come up with the definition in a space context”

Although there is still no formal definition on such legal concept, at the International Law Association (ILA) Conference in Montreal in 1982, the basic features and principles of CHM have been identified, such as ¹⁶⁷

- a. Non-appropriation of the area and of its natural resources;
- b. Sharing of benefits among all;
- c. Protection of the physical environment and the conservation of natural resources, bearing in mind future generation as well;

¹⁶⁵ Christol, Carl Q, *Space Law: Past, Present and Future*, p.383 (1991)

¹⁶⁶ Walsh, Kevin B, “Controversial Issues Under Article XI of the Moon Treaty”, VI, *Annals of Air and Space Law*, p.490 (1981).

¹⁶⁷ See Wassenbergh, Henry A, “The Moon Treaty in Retro and Prospect”, *Sylabus on Air and Space Law*, Leiden University, Rimte Recht B, p.267 (1990).

- d. An organizational framework for mankind including a system of management; and
- e. Uses for peaceful purposes

Meanwhile, during the formulation of the United Nations Convention on the Law of the Sea which was signed in Montego Bay in 1982, the Government of Malta Stated that the concept of CHM had five (5) basic implication:¹⁶⁸

- a. The CHM cannot be appropriated, it could be used but not owned;
- b. The use of CHM required a system of management in which all users must share;
- c. It implied an active sharing of benefits including not only financial benefits derived from shared management and exchange and transfer of technologies;
- d. The principle of CHM implied eventual reservation for peaceful programs; and
- e. It implied transmission of the heritage substantially unimpaired to future generations.

Some representatives from developed countries have expressed their concerns about the interpretation of CHM on the draft Treaty on the law of the Sea which in their opinion did not conform to the national interest of countries with free enterprise/free market economies, particularly as they related to such matters as production limitation, technology transfer, dispute settlement and competition.¹⁶⁹

From the developing countries perspective, what is more important in the interpretation of this concept is that it should guarantee access rights of developing countries to such natural resources. For that purpose, certain mechanism should be created under the supervision of an international body, which should also include a mechanism for its enforcement.

¹⁶⁸ See Christol, *op.cit.* p.386.

¹⁶⁹ See Walsh, Kevin B, *op.cit.* p.492.

2. **The Non-Appropriation Principle**

The Principle of non-appropriation as it is stated by Article 2 of the Space Treaty of 1967 and Article XI para 2 of the Moon Treaty of 1979 is a very important principle with regard to access rights of developing countries to the natural resources on the moon and other celestial bodies. As commonly understood, this provision forbids any formal claim of territorial sovereignty over parts of outer space, including the moon and other celestial bodies.¹⁷⁰

On this principle, MARCOOF pointed out that states can exercise exclusive rights over celestial bodies or parts of them even without explicitly claiming territorial sovereignty. Therefore in his opinion, the prohibition of national appropriation also comprises variations of exclusive competences that do not fall in the category of “sovereignty”.¹⁷¹

The scope of interpretation of the non-appropriation principles also raises different opinions among scholars; some of them are of the opinion that the use of an individual satellite slot of the geostationary orbit for more than 30 years can be deemed as a violation of these principles,¹⁷² while others question whether utilization of space is possible without appropriation at all.¹⁷³

Concerning the meaning of non-appropriation principle as stated in article XI of the Moon Treaty, it refers to prohibition on ownership: neither the surface nor the subsurface of the moon, nor any parts thereof or natural resources in place, shall become property of any state, international intergovernmental or non-governmental entity or of any natural person.¹⁷⁴

Whatever the interpretation thereof would be, it would be born in mind that it should prevent any kind of monopoly,

¹⁷⁰ See Bittlinger, Horst. “Keep Out Zones and the Non-Appropriation Principle of International Space Law”. Proc. Colloquium on the Law of Outer Space, p.7. (1988).

¹⁷¹ Ibid

¹⁷² See Gorove, Stephen. “The Geostationary Orbit: Issues of Law and Policy”, American Journal of International Law, page 449 (1979).

¹⁷³ Bittlinger, Horst. Op.cit, p.7.

¹⁷⁴ See Article XI para 3 of the Moon Treaty 1979.

which is merely based on the technical and financial capability of a country. This practice will only be for the benefit of developed countries while neglecting the needs and interests of the late arrivals (developing countries).

B. Access to the benefits from the development in space science and technology

As it is generally recognized, the progress in space science and technology has brought improvements to human life, and people are enjoying these benefits in many fields of human activities. But, as we can also observe, these are mostly enjoyed by developed countries. In the field of communication for examples, according to the report of the Maitland Commission, of the 600 million telephones in the world, three quarters are concentrated in 9 (nine) countries. The remainder is distributed unevenly throughout the world. While telecommunication is taken for granted as a key factor in economic, commercial, social and cultural activity in industrialized countries, and are considered an instrument for growth, in most developing countries systems are not adequate even to sustain essential telephone services. In many areas, there are no services at all. The Commission asserted furthermore that neither in the name of humanity, nor on grounds of common interest, such a disparity is acceptable. Three quarters of the world's population live in countries with ten telephones or less than one for every 100 persons; over half live in countries with less than one telephone for every 100 persons.¹⁷⁵

The inequality as shown by those data above was caused by the incapability of most developing countries to procure such a kind of technology which is very expensive according to their standards. To overcome this problem, there is a need to develop a cooperation mechanism in the international sphere, either between developed and developing countries, or among developing countries themselves. The question is whether such international cooperation is obligatory under

¹⁷⁵ See Gillick, David. "Closing the Missing Link", *Satellite Communications, International Communications and Broadcasting*. Proc of the Conferences held in London, p. 55 (1985).

existing space law? This legal question should be clarified for further development of future space law, especially with regard to commercial utilization of outer space.

The other question is related to the application of the non-discrimination principles in order to assure that developing countries will get access to benefits derived from progress in the field of space science and technology. This non-discrimination principle is not only limited to race, political, ideological, or religious considerations, but also to their financial capability. Therefore, considerations should also be directed toward the possibility of rendering facilities or offering lower price or even preferential treatment to developing countries with priority to encourage their development.

C. Access to space science and technology

As we already know, most of the technological capabilities are in the hands of developed countries, including space sciences and technology. In order to encourage developing countries to develop their technical capabilities, there is a need for a transfer of technology from developed countries to developing countries. But, in fact, the space powers do not give developing countries access to space technology because of its military potentials.

According to this policy, the space powers provide technology assistance to developing countries normally on a reimbursable basis, furnishing launch and other services, such as engineering assistance and certain hardware, but a true transfer of know-how does not take place.¹⁷⁶ For instance, according to NASA policies, cooperative agreements are designed to avoid leakage of critical technology. Thus, prior to engineering in to a proposed cooperative undertaking, NASA is assured that the cooperating partner has the financial resources and it has a demonstrated technical capability, so that the export from US sensitive advanced space technology is minimized.¹⁷⁷ Sometimes

¹⁷⁶ See Leister, Valnora, "South to South Cooperation in Outer Space: The Brazil - China Agreement". Proc. Colloquium on the Law of Outer Space. p.15 (1989).

¹⁷⁷ Leister, Valnora, "Prospects for a Latin American Space Agency". Proc. Colloquium on the Law of

restrictions on the use or transfer of technology are also based on political grounds.¹⁷⁸

To provide developing countries access to space science and technology, there is a need for some changes to the present situation. For that purpose, the establishment of certain mechanism for the transfer of technology will become necessary. This should have supported by close cooperation between developed and developing countries. Fruitful cooperation will provide mutual benefits for both sides. On the one hand, it will help developing countries to accelerate their development; on the other hand developed countries will get more opportunity to expand the market for their products. When it is necessary, in order to prevent such technology from being abused, which could endanger international peace and security, some restriction and condition may be imposed. But, these should not be used as a legal basis to hamper the general policy on transfer of technology to developing countries.

On the scope of transfer of technology, it is worth to note CHARLES W LINDSEY's statement as follows: ¹⁷⁹

"... the transfer of technology is not only the transfer technology across national boundaries, but also its control"

Although its realization will be difficult, a true transfer of technology should fulfill such criterion.

Meanwhile in the New International Economic Order's (NIEO) framework, more emphasis has been directed towards transfer of "technological know-how" and the technology to process raw materials for improving the prosperity of developing countries.¹⁸⁰ Further, the need was stated for:¹⁸¹

Outer Space. p.127 (1988).

¹⁷⁸ An example of this restriction is the US suspension of export licensing approving use of China's Long March Booster to carry ASIASAT. The State Department of Office of Munitions Control had declared it cannot revoke this suspension until Chinese Government return to normalcy.

¹⁷⁹ Lindsey, Charles W. "Transfer of Technology to the ASEAN Region by US Transnational Cooperation", Vol.3, No.2. ASEAN Economic Bulletin, p.225 - 226 (1998).

¹⁸⁰ See Declaration on the establishment of a New International Economic Order, General Assembly Resolution no 3201 (s-VI), May 1974.

¹⁸¹ Ibid.

“Giving to the developing countries access to the achievement of modern sciences and technology, and promoting the transfer of technology and the creation of indigenous technology for the benefits of developing countries in forms and in accordance with procedures which are suitable to their economics”

Those concepts of transfer of technology should be taken into consideration in the process of transfer of technologies in space science and technology to developing countries.

D. Access to Enter the International Market

In the last few years, we can observe that in several field of space activities certain developing countries, such as the People’s Republic of China, have shown tremendous progress, especially in the field of space transportation. The Chinese satellite launcher “Long March” for example, has proven its ability to compete with other competitors from the United States, Western Europe and the Soviet Union. This has been mainly made possible by its low (especially labor) costs, which enable it to offer its services for a considerably lower price compared with other launch providers. This has resulted in growing concerns among western countries such as The United States and some European countries. Therefore, in order to prevent the Chinese competitor, the United States for example, has forced China to sign an agreement with the United States Government regarding “International Trade in Commercial Launch Services” in January 1989. According to this agreement, China was only allowed to launch 9 (nine) western commercial communications satellites in a six-year’s period that will end in 1994.¹⁸² Besides, the United States may impose its Export Control Act to prevent satellites or its component parts to be launched by the Chinese launchers. Some Western European countries also took similar actions against China. These will of course limit China in entering the international market.

¹⁸² Space News, September 10-16, 1990. For further analysis of this Agreement, see Fenema, H. Peter Van, “Cooperation”, Paper Presented at Conference on the Law, Policy and Commerce of International Air Transport and Space Activities, Taipei. P.7 (1991).

These kinds of protectionist acts will of course hamper access of developing countries to enter the international market. The legal questions which may arise from that illustration are whether these acts can still be deemed fair competition in the international market. Can China also be deemed to conduct dumping policy by offering lower prices? Is there any criterion to calculate “true costs”? Can the principles of General Agreement on Tariff and Trade (GATT) be applied to international trade in high technology and trade in services? Can developing countries be granted a kind of Most Favored Nation (MFN) clause to assist them in entering the international market? The answer to these legal questions will be useful as considerations in the legal formulation of the framework for commercial utilization of outer space.

III. CHALLENGES AND OPPORTUNITIES FOR DEVELOPING COUNTRIES

Besides those legal problems concerning access of developing countries as stated above, other questions will also arise in regard of the development of commercial utilization of outer space, especially with regard to the interests of developing countries. The first question is whether developing countries will get more opportunity and benefits from such development? On the one hand, there are some concerns among developing countries that commercialization will:

- Bring increases in launch costs for developing countries whether they use private or governmental launchers;
- Lead to foreign domination in developing countries telecommunications;
- Increase the costs for launch insurance;
- Increase the costs for un-enhanced or value added data;
- Concentrate commercial-companies’ attention on the stronger developing countries business an urban market, while neglecting rural or remote areas;

- Increase cultural alienation and adoption of foreign values;¹⁸³ and
- Mean the end of open and non-discriminatory access to data, the very policy they argued forcefully against for so many years.¹⁸⁴

These concerns will be worsened by common weaknesses on the part of developing countries that might become obstacles to their participation in space activities, such as:¹⁸⁵

- Lack of funding
- Lack of information/communication flow to developing countries;
- Lack of experienced technical/scientific personnel;
- Political and socio-economic tensions between developed and developing countries;
- Lack of sufficient scientific infrastructure;
- The difficulty of getting good data early.

On the other hand, there is an optimism that commercialization of space activities will bring greater opportunity and benefits for developing countries. Commercialization, if it succeeds, will dramatically restructure the market for space launch and missile technology, and the biggest beneficiaries may well be in the Third World.¹⁸⁶

In addition, many developing and less developed countries have found that INTELSAT which operated on a commercial basis can become a way of overcoming intense topographic and other barriers to the establishment of satisfactory internal telecommunications within their territories. They also have found INTELSAT circuits a cost-effective answer to their domestic telecommunication needs.¹⁸⁷ INTELSAT has had an assistance and

¹⁸³ Levine, Arthur L. "Commercialization of Space: Implications for US Relation with Developing Countries" p. 126 - 130.

¹⁸⁴ Myers, David S. op.cit. p.132.

¹⁸⁵ Specter, Christine, "International Space Year: An Opportunity to Relate Earth Observation Activities to the Benefits and Interests of Developing Countries" Proc. Colloquium on the Law of Outer Space. p.37 - 38 (1989).

¹⁸⁶ See Karp, Aron, "Space Technology in the Third World, Commercialization and the Spread of Ballistic Missiles", in Space Policy. P.163 (1986)

¹⁸⁷ See Lyall, Francis, "Space Telecommunications Organizations and the Developing Countries, Proc. Colloquium on the Law of Outer Space. p. 245 (1989).

development program for some years. It has been expanded by the creation of a development fund that provides technical assistance, training and help in arranging financing for communication development projects.¹⁸⁸

Commercialization will also lead to opportunities that would help the developing countries. One private firm, Pan American Satellite Cooperation (PANAMSAT) for example, which offers services to Latin America, plans to have high powered spot beams especially designed to facilitate receipt of signal by small earth stations. Other firms will probably offer innovations which are especially helpful for rural development.¹⁸⁹

In the field of financing, some United States banks for example, have helped to finance some developing countries domestic satellites such as Brazil, India, Indonesia and Mexico, and regional satellite system such as ARABSAT and the South Pacific System.

From the illustrations above, it appears that what is important to be considered is how to promote that commercialization could bring more opportunities and benefits for developing countries, while minimizing its negative impacts. Commercialization should also encourage participation by private sectors, either in developed or developing countries, and to improve the welfare and prosperity of mankind. For that purpose, international cooperation, bilateral, regional or global will be the key factor.

IV. CONCLUDING REMARKS

- A. As commercial utilization of outer space shows good prospect, immediate improvements to existing international law and space law have become necessary in order to guarantee that such activities can be conducted in a fair, just and orderly manner. These improvements should also include anticipation of all possible legal problems which may arise from future commercial activities in space.
- B. In formulating regulations governing commercialization utilization of outer space, considerations on the needs and interest of developing

¹⁸⁸ See Pelton, Joseph S. "INTELSAT and the Challenge of Competitive Systems, 3, Space Policy. p.328 (1985).

¹⁸⁹ Levine, Arthur L. *op.cit.* p.127.

countries should be taken into account, especially with regard to access of developing countries to the benefits of the natural resources in outer space, including the moon and other celestial bodies; to the benefits from the development in space science and technology; access to the space science and technology itself; and access to enter the international market. For the purpose, clarification should be made to some legal concepts in existing international law and space law, such as: the common heritage of mankind (CHM); non-appropriation; non-discrimination; international cooperation; transfer of technology; fair competition, etc.

- C. In the further development of law governing the commercialization utilization of outer space, consideration should also be directed towards the efforts to assure that commercialization will bring more opportunities and benefits, either to develop or developing countries, while minimizing its negative impacts. International cooperation either in the global, regional or bilateral scopes will be the key factor in achieving such a goal.

THE CONTRIBUTION OF THE DEVELOPING COUNTRIES TO THE LEGAL FORMULATION OF FUTURE SPACE LAW*

I. INTRODUCTION

Three decades after the first human venture into space with the launching of Sputnik I, space science and technology have reached an advanced stage. A whole series of successes has been achieved in this fourth dimension of human activity,¹⁹⁰ including the landing of man on the Moon in the Apollo II mission; the construction of a space platform/station and space laboratory to carry out scientific research; the landing of an unmanned spacecraft on the surface of Mars; also, the launching of the Space Shuttle, regarded as marking a new era in space activity.

Space science and technology have brought improvements in human life. Many satellites have been launched into outer space for a variety of functions such as telecommunications, meteorology, remote sensing, navigation etc. More diverse activities are being considered. These range from constructing large space structures for industry, to burying the dead in a certain orbit

* The Contribution for the Book: Space Law Views of the Future, Kluwer, the Netherlands, 1988

¹⁹⁰ Land was the first dimension of human activity; the second started when man activities to the water, and the third dimension began when aircraft as a means of air transportation was invented.

in outer space.¹⁹¹ Now, people are enjoying the benefits achieved by space science and technology: direct television broadcasting by satellites placed in outer space enables the direct transmission of pictures of international event from all over the world; direct telephone links via satellite connect people from different countries; the use of meteorological satellites for weather forecasts; the use of remote sensing satellite to detect natural resources on earth and as an early warning system against natural disasters.

Besides improving human life and prosperity, space activities may also threaten human life and the environmental balance. The re-entry of the Soviet nuclear powered satellite “Cosmos 954” into Canadian territory on 24 January 1978 highlights the danger of such activities.¹⁹² With the rapid growth of satellites launched into outer space using nuclear power sources, the threat to human life increases. Environmental harm may also result from such other activities as the continued and unregulated use of high energy laser beams; high frequency microwave emissions; ozone destroying aerosols and the introduction of disease laden objects into space. Weather modification activities may also be fitted into this category.

Such contamination and pollution may result from planned activities or experiments, or a result from accident.¹⁹³ Still fresh in the mind is the “Challenger” disaster which took the lives of all its crew members. However, this was not the first accident. Virgill Grissom, Edward White and Robert Chafee died on 27 January 1967 whilst undergoing a test for an Apollo flight. Also, on 30 June 1971, the crews of Soyuz II (Georgy Dobrovolsky, Victor Patsayev and Vladislav Volkov) were found dead in their cabin.¹⁹⁴ Furthermore, the stationing of satellites in the geostationary satellite orbit (GSO) can cause radio frequency interference and could result in collisions between space objects.

¹⁹¹ A private enterprise called 3M has even offered to bury human bodies by putting them in a capsule and placing it in a certain orbit in outer space. With the natural characteristics of outer space, it is hoped that the bodies would not decay.

¹⁹² See Chistol, Protection of Space from Environmental Harms, *Annals of Air and Space Law* 433 (1979). See also Bhatt, *An Ecological Approach to Aerospace Law*, id, at 385.

¹⁹³ See Lay and Taubenfeld, *Modification of the human environment, in the Future of the International Legal Order: The structure of the International Environment* 124 - 154 (C.E. Black and R.A. Falks, editors, 1972).

¹⁹⁴ See Manfred Lachs, *The Law of Outer Space* 2 (1972).

Although the 1967 Treaty on Principles Governing the Activities of States in Exploration and Use of Outer Space was designed to guarantee that such activities should be for the benefit of and in the interest of all countries, and should be for peaceful purposes, it may be observed that 75% of the activities in outer space have been conducted for military purposes.¹⁹⁵ Space Powers are competing to gain military superiority with the aid of space science and technology. Much space research has been directed at developing sophisticated weapons and space defense systems such as anti-satellite weapons, laser beams and particles beams. An arms race in space increases the potential threat to human lives and the environment.

So far, space activities have been dominated by “the Space Powers (USA and USSR) and “the Potential Space Powers” (Europe, Japan, India, China and Canada), while most of the developing countries are “Late Comers” and as a consequence, the achievements of space technology have largely been enjoyed by the developed countries. For example, in the field of communications, it was stated at the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space that as of 31 December 1981, a total of about 220 satellites have been launched into the geostationary orbit (GSO) for various telecommunication purposes (including broadcasting, meteorology, and other service, as well as for scientific experimentation) or had been notified to the ITU as being planned. Of these, 63 satellites are intended for international public telecommunications services (INTELSAT, INTERSPUTNIK, INMARSAT). Of the 157 remaining satellites, 128 have been notified by the developed countries and 29 by the developing countries.¹⁹⁶ This imbalance is a cause of specific concern for the developing countries.

The purpose and objective of this chapter is to analyze several areas of existing space law as regards the experience, needs and interests of developing countries and to examine whether existing space law has met

¹⁹⁵ See Jasani, *The Military Use of Outer Space*, in *World Armament and Disarmament* 351 (SIPRI Yearbook, 1984).

¹⁹⁶ See Paragraph 62 of the Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (Vienna, 9-21 August 1982; hereinafter *Unispace Report*).

the needs of all states in a just, equitable and rational way. Several questions need to be asked concerning existing space law:

- Are the legal principles laid down by existing space law able to accommodate the interests and needs of all countries, irrespective of their degree of economic or scientific development?
- Are there any doctrines which are no longer relevant in accommodating the needs and interest of all countries in a just, equitable and rational way?
- In what have the developing countries so far taken part in the legal formulation of space law?

The answer to these questions may be useful when considering the future development of space law. In order to formulate future space law, we must be able to predict future space activities, for these will throw up new legal problems. Participation of private enterprises in space, for example, deserves urgent consideration to guarantee that such activities will be covered by law. Several methods may be applicable in formulating future rules governing space activities.¹⁹⁷ One may:

- Commence with international law and apply its principles by way of analogy to relationships in space; and
- Create new principles of law based on the characteristic nature of space activities.

II. THE DEVELOPMENT OF INTERNATIONAL SPACE LAW

Before analyzing the present law, it is important, briefly, to trace the development of international space law, in order to obtain a comprehensive picture of how it was formulated, including the participation of developing countries and the problems involved.

The development of international space law is closely related in the successful mission of Sputnik I to orbit the Earth on 4 October 1957. Immediately, after that historic success, the General Assembly of the United

¹⁹⁷ See Sierra Vasques, *Cosmic International Law*, translated by Elaine Malley, Wayne State University Press 19 (Detroit 1965).

Nations issued resolution 1148 (XII) which stressed the need to draw up an international treaty on disarmament including a provision that any object launched into outer space should be for peaceful purposes.¹⁹⁸

The development of space law should not be separated from the role of international law and international cooperation. International law has codified some fundamental principles. While international cooperation guides this activity towards the benefit of mankind and international peace.¹⁹⁹ The establishment of several international organizations, including the Committee on Space Research (COSPAR), the World Meteorological Organization (WMO), the International Astronautical Federation (IAF), the International Telecommunication Union (ITU) and even the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) are the result of international cooperation.

Space law has developed in two forms: firstly, in the form of a series of resolutions, either multilateral or unilateral, secondly, by the negotiation of international conventions.²⁰⁰

Several resolutions are worth noting. General Assembly resolution 1721 of 20 December 1961 states that international law including the Charter of the United Nations shall apply to all activities in outer space, including the Moon and other Celestial bodies. It also stresses that the exploration and use of outer space should be for peaceful purposes. Resolution 1802 (XVII) of 14 December 1962 urged for an immediate effort to formulate legal principles governing the activities of states in the exploration and use of outer space, including the Moon and other celestial bodies. The resulting principles also contain provisions on international liability for damage caused by aircraft accident, on the giving of assistance to astronauts and the return of astronauts and space objects in case of accident, distress or emergency landing.²⁰¹ Resolution 1884 (XVIII) of 1963 contains

¹⁹⁸ See Lachs, *supra* note 6. See also Dembling, *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies*, Manual on Space Law 1 (N. Jasentuliyana and R.A. K. Lee, Editors 1979).

¹⁹⁹ See Priyatna Abdurrasyid, *Pengantar Hukum Ruang Angkasa dan Space Treaty 1967* (BPHN, Jakarta 1972).

²⁰⁰ *Ibid.*, at 15.

²⁰¹ G.A. Res. 1802 (XVII), 14 December 1962, Paragraph 3 of the Consideration and part I of the Dictum.

provisions prohibiting the placing of nuclear weapons and weapons of mass destruction in outer space. This resolution prohibits military activities, and also confirms the principle that outer space, including the Moon and other celestial bodies, should be used for peaceful purposes.

Resolution 1962 (XVIII) of 113 December 1963 is to be regarded as the most important, since it lays down fundamental principles of law concerning state activities in outer space, including the Moon and other celestial bodies. These principles were later adopted in the form of a treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and other Celestial bodies.²⁰²

We should not ignore contributions from several independent bodies such as the “David Davies Memorial Institute for International Studies and the “Institute de Droit International” which have made draft proposals for the formulating of Space Law.²⁰³

The above resolutions, though not as binding as international conventions, have played an important moral role, since they reflect the state of development of legal thought at that time.

The Outer Space Treaty of 1967 was the first international convention of a general character applied to outer space.²⁰⁴ It also marked a new trend in the development of international law, because it is universal in scope and character to outer space. It also marked a new trend in the development

²⁰² The 9 fundamental principles are:

- Freedom of Exploration and Use of Outer Space and Celestial Bodies
- Non-appropriation of Outer Space or Celestial Bodies
- Exploration and Use of Outer Space and Celestial Bodies in Accordance with the Fundamental Principles of International Law, including the Charter of The United Nations
- Partial Demilitarization of Outer Space
- Retention by States of Sovereign Rights over Space Objects Launched into Outer Space
- International Responsibility of State Rights for National Activities in Space, including Liability for Damage caused by Space Objects
- Prevention of Potentially Harmful Consequences of Experiments in Outer Space and on Celestial Bodies
- Assistance to Personnel of Spacecraft in the Event of Accident, Distress or Emergency Landing
- International Cooperation in the Peaceful Exploration and Use of Outer Space and Celestial Bodies.

²⁰³ The Study Group on The Law of Outer Space of the David Davies Memorial Institute has drafted provisions governing the exploration and use of outer space. Also, the institute de Droit International draft a resolution on 11 September 1963 on the Law of Outer Space. For details, see also Law and Politics in Space 153 ff. And 181 ff. (Maxwell Cohen, editor, 1964).

²⁰⁴ See Dembling, supra note 11, at 1.

of International law, because it is universal in scope and character.²⁰⁵ The Outer Space Treaty laid down broad fundamental principles applicable to the use and exploration of outer space, it was understood that further conventions would be needed to provide more specific rules as outer space activities progressed. The Rescue Agreement of 1968,²⁰⁶ the Liability Convention of 1972,²⁰⁷ the Registration Convention of 1975²⁰⁸ and the Moon Agreement of 1979²⁰⁹ are all international conventions which have been developed within UNCOPUOS, such as, for example, the use of nuclear power source by space objects, direct broadcasting by satellite and remote sensing.

III. ANALYSIS

There are those who claim that developing countries have contributed very little during the legal formulation of existing Space Law. This was due to a lack of technical knowledge and information on the part of developing countries concerning space activities. Consequently, the legal principles that have been laid down accommodate the interest of the developed countries more than they protect the interests of the developing countries.

It is our task to analyze whether existing space law has covered the need and interest of all countries, including the needs and interest of the developing countries. Key questions arise. Firstly, are all states with the content of existing space law? Secondly, did most of the countries participate in its formulation? Finally, we should also analyze whether existing space law is able to solve legal problems that may arise from future space activities; this will be useful in verifying the validity of existing space law.

As was explained previously, existing space law in a broad sense comprises all the regulations governing space activities, starting with the

²⁰⁵ See Christol, *supra* note 4 at 433 ff.

²⁰⁶ The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of 1968 was based on the principle that astronauts are the envoys of mankind as laid down in the Outer Space Treaty of 1967.

²⁰⁷ This Convention was based on Articles 6 and 7 of the Outer Space Treaty of 1967.

²⁰⁸ The Convention on Registration of Objects Launched into Outer Space of 1975, based on Article 8 of the Outer Space Treaty of 1967.

²⁰⁹ The Agreement Governing the Activities of States on the Moon and other Celestial Bodies of 1979 was designed to govern the activities in the exploration and use of natural resources on the Moon.

resolutions of General Assembly, followed by the Outer Space Treaty 1967 (The Magma Charta) and including any further conventions or agreements based on the principles laid down in the Outer Space Treaty.

However, existing space law has several weaknesses, which will be discussed below.

A. The meaning of “peaceful uses”

Scholars have noted that the meaning of “peaceful uses” is still open to various interpretations, since there is no official explanation or criterion concerning the meaning.

At the beginning of the space age, several views were advanced as to its meaning.²¹⁰ One view holds that military activities in space can never be peaceful. The letter interpretation was applied by President Reagan to support his proposal for a Strategic Defense Initiative. This proposal aims at developing a space defense system involving sophisticated technologies such as laser beam weapons, particle beam weapons, anti-satellite weapons, and the establishment system is to make strategic nuclear missiles “important and obsolete”.

The continuation of arms race activities in Outer Space is pushing mankind further away from peace. The situation increases the concern of developing countries that they will be potential victims of such space activities. Meanwhile, the idea of discussing military activities in Outer Space at UNCOPUS was supported mostly by the developing countries and opposed by some of the space power.

At the second United Nations Conference on the Peaceful Uses of Outer Space (UNISPACE’82), debates about the legal competence of this forum to discuss military activities in Outer Space colored the proceeding²¹¹. The Space Powers asserted that the Committee of Disarmament is the only body with the competence to discuss all matters concerning disarmament, including military activities in Outer Space. On the other hand, most developing countries were of

²¹⁰ See Carl Q. Christol, *The Modern International Law of Outer Space* 22 (1982). See also: National Paper Indonesia, overview on international space science and technology and space application in Indonesia, *Unispace Report*, supra note 8, at 5.

²¹¹ See *Unispace Report*, supra note 8.

the opinion that UNCOPOUS is legally competent, since almost all international treaties governing the activities of states in the exploration and use of Outer Space were concluded by this Committee.

Most Arms Talks have been dominated by the Superpowers, with the result that the agreements that have been concluded mainly reflect their interest. The interest of other countries has not been satisfactorily accommodated. Thereof, the efforts to give UNCOPOUS legal competence to discuss military activities in outer space reflects a new consciousness among developing countries to play an active role in protecting human life from ultra hazardous activities and maintaining international peace and security. Therefore, the refusal to discuss military activities in outer space based on the opinion that this body established merely to govern the exploration and use of space in peace time seems to be unreasonable and exaggerated.

B. Non-appropriation of Outer Space or Celestial Bodies

So far, this principle has been applied in favor of the developed countries. In the field of communications, for example, this can be seen in the formulation of Article 33 (2) of the ITU Convention of 1973 (Malaga-Torremolinos). This article provides that “in using frequency bands for space radio services, members shall bear in mind that radio frequencies and the geostationary satellite orbit are limited natural resources, which must be used efficiently and economically so that member 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”.²¹²

This article illustrates the “first come, first served” principle. Consequently, developed countries are able to fully capitalize the fruits of space science and technology and their spin-offs, further improving their standards of living. The developing countries, earthbound by their limited technological capabilities, have to continue to live of their dwindling natural resources whilst buying high-priced products from

²¹² See Priyatna Abdurrasyid, *Fact and Issues Concerning the Geostationary Orbit (a Legal View)* 2 (1985)

the rich nations. Of the currently operational civilian communications satellite opening in the 6/4 and 14/11 Gigahertz frequency bands, 49 belong to developed countries, 15 to the 109-member consortium INTELSAT, and only 4 to developing countries.²¹³

As Dr. Jasentuliyana has stated,²¹⁴ the concerns of the developing countries are essentially two folds; firstly, concerning access to the geostationary orbit, and secondly, concerning the fact that they cannot cope with the technical and financial burdens imposed by the technical requirements involved in satellites and earth stations. With regard to access to the geostationary orbit, the “Bogotá Declaration” of 1976 by the equatorial countries stated that the claim to the geostationary orbit was not intended as a “territorial claim” but more as a limited natural resource. Although this declaration was opposed by most of the developed countries and several developing countries, it has in fact raised a new consciousness amongst developing countries that the formulation of provisions concerning the exploration and use of Outer Space should take into account the needs and interests of developing countries. At UNISPACE’82, this new consciousness was witnessed in the consideration of the special needs of developing countries with respect to the geostationary orbit, such as the goal of increasing effective communications capacity through technological advances, in order to accommodate the communications needs of all technological, which may conflict with the goal of the developing countries in increase their self-reliance in space technology. The conference finally recommended that any future plan and/or arrangement should not result in the unnecessary hastening of the implementation of plants to the detriment of the financial interests and self-reliance of the developing countries.²¹⁵

As a result of increasing effort by the developing countries, Article 33 (2) of the ITU Convention of 1973 (Malaga-Torremolinos) was

²¹³ See Jasentuliyana, *The Developing Countries and The Geostationary Orbit*, Thirteenth Annual Friedman Conference on the Global Telecommunications Revolution; An Emerging Challenge and Opportunity for International Law 2 (Colombia University School of Law, 29 March 1985)

²¹⁴ *Ibid.*

²¹⁵ See the Feasibility of Obtaining Closer Spacing of Satellites in the Geostationary Orbit, G.A., Distr. General A/AC.105/3401 Rev 1. Committee on the Peaceful Uses of Outer Space.

amended at the Plenipotentiary Conference held in Nairobi in 1982. The reformulated Article 10,3c (mod 67) reads as follows:²¹⁶

“The essential duties of the International Frequency Registration Board shall be (among others) to furnish advice to members with a view to the operation of the maximum practicable number of radio channels in those portions of the spectrum where harmful interference may occur, and with a view to the equitable, effective and economical use of the geostationary orbit, taking into account the needs of members requiring assistance, the specific needs of developing countries as well as the special geographical situation of particular countries”.

Concerning the application of the “non-appropriation” principle, some scholars have asked whether this means that a state is not allowed to claim certain exclusive rights over a site which it discovered and physically occupied first, and that it is not permitted to assert exclusive rights concerning lunar exploration and use the same site if no other favorable landing spot exist in the area.²¹⁷

C. International Responsibility of State for National Activities in Space, Including Liability for Damage Caused by Space Objects

This principle is contained in Articles 6 and 7 of the Outer Space Treaty of 1967 and was later formulated in detail by the Convention on International Liability for Damage Caused by Space Objects of 1972; popularly known as the “Liability Convention”. The Convention emphasized the need to elaborate international rules and procedures concerning liability for damage caused by space objects and to ensure, in particular, the prompt payment of a full and equitable measure of compensation to victims of such damage. Thus, this treaty was “victim-oriented”. The application of the principle of absolute liability for damage on the surface of the Earth or to aircraft in flight²¹⁸ illustrates this “victim-oriented” character of the Convention.

²¹⁶ See Priyatna Abdurrasyid, *supra* note 24, at 2.

²¹⁷ O.O. Ogunbanwo, *International Law and Outer Space Activities* 73 (1975). See also Vlastic, *The Space Treaty: preliminary evaluation*, 55 *California Law Review* 512/513.

²¹⁸ Article 2 of the Liability Convention of 1972.

Though the Liability Convention aims at protecting the interest of the victim, if one reads carefully, it seems that some of the articles contain loopholes regarding legal problem that may arise in the future:

- The term “damage” as mentioned in Article 1 (a) is limited to physical and direct damage and does not cover indirect damage or non-physical damage. Future space activities involving the use of nuclear power sources will increase the possibility of the occurrence of indirect and non-physical damage. Future space activities involving the use of nuclear power sources will increase the possibility of the occurrence of indirect and non-physical damage. Space law should anticipate regulating such a possibility.
- The Space Shuttle, which as a means of future space transportation, shows characteristics of both a spacecraft and an aircraft, is not covered by the definition of “Space Object”.
- The government-to-government procedure for claiming compensation cannot ensure the prompt payment of compensation. Moreover, this procedure does not cover liability arising from activities of private enterprises.
- The effectiveness of international cooperation clauses in case of large scale danger where different interpretations have been raised may be in some doubt, as shown by the diplomatic communications between the USSR and Canada in the case of “Cosmos 954”.

Since the Liability Convention is open to amendment, it is still possible to incorporate such amendments, particularly with regard to the participation of private enterprises in the commercial use of Outer Space, to meet the requirements governing future space activities as described above.

With regard to future commercial space transportation, the question is whether the Liability Convention should be amended by adding some provisions to cover this activity or whether a new convention should be formulated, specifically designed to cover all

problems that may arise. It may be useful in this respect to draw an analogy with the “Warsaw System” governing international air transport.

The Indonesian experience in launching its telecommunications satellite “Palapa B-2” may also provide a useful experience in formulating future rules on space law. This satellite failed to reach its orbit after separation from the shuttle orbiter. Without going into the technical aspects of this failure, it is interesting to note the terms of the launching contract between NASA and the Department of Tourism, Post and Telecommunication of the Republic Indonesia, in particular concerning “inter-party waiver liability” and “third party liability”.

The waiver of inter-party liability was based on the “NASA Shared Launch Agreement for Payloads Launch and Associated Service” issued by the NASA office of space transportation operation on 8 March 1979. It stipulates that the “user” of the shuttle service should agree to its provisions. Article V, paragraph 3 of this “Cargo Launch Agreement” on the allocation of certain risks, states:

“NASA and the user agree that, with respect to damage to persons property involved in a Space Transportation System (STS) operation, neither NASA or the User, nor any person who has contracted with NASA or the user for STS services or who owns property or employs a person to be flown on the Shuttle, shall make any claim with respect to injury to or death of its contractor’s property or personnel caused by NASA, the user or any other persons involved in STS operations during such operation, whether such injury, death or damage arises though negligence or otherwise.”

As a consequence of this provision, each party has its own property in order to cover possible damage during the operation. A similar provision applied to Palapa B-2 which was lost in space.

Indonesia considered the waiver of the liability provision to be unjust and unequal. Technically, the possibility of fault or contributory negligence on the part of the User (Indonesia) was very small. If the

shuttle is used much more frequently as a means of space transportation and used commercially, either by states or private enterprises, the launching on a more equal basis.

On the problems of “third party liability”, Article V of the Liability Convention provides:

“1. Whenever two or more states jointly launch a space object, they shall be jointly and severally liable for any damage caused.”

The above provision was applicable to the launching of Palapa B-2 since it was joint launching. According to paragraph 2 of Article V, the participants in a joint launching may conclude an agreement apportioning among themselves the financial obligations for which they are jointly and severally liable. After separation of the satellite from the shuttle orbiter, the burden of the third-party liability was placed on the user (the owner of the satellite). This may be implied from Article V (2) of the “NASA Shared Shuttle Launch Agreement and Associated Service” which states:

“The user shall obtain, at no cost to NASA, insurance protecting the US government and its contractors from any third party for any damage resulting from a free-flying payload after separation of the payload from the shuttle.”

From the above provisions, it can be concluded that the obligation concerning third party liability before the separation was placed upon NASA.

III. CONCLUDING REMARKS

- A. As existing space-law cannot all legal problems arising from future space activities, a comprehensive study should be conducted by the international community in order to contribute towards the legal formulation of future space law that will meet the needs of future space activities.

- B. The effectiveness of future space law depends upon whether it takes into account the need and interest of all countries, based on the principle of equality, justice and rationality, including consideration of the future capabilities of the developing countries in space science and technology.
- C. Active participation and contributions from the developing countries is absolutely necessary to formulated future space law.
- D. There should be close and mutual cooperation between the developed and developing countries in the fields of law, science and technology.

INDONESIAN SPACE POLICIES AND INSTITUTIONS*

I. GENERAL

One of the reasons why application of space science and technology for Indonesia is very important is the specific geographical situation in Indonesia. As an Archipelago State, which comprises of totally about 17,000 islands, more than 214 million people, and 200 different local languages, in fact already poses big challenges and constraints, especially in preserving its unity.

Thanks to the human achievement in space science and technology and the right vision of the Indonesian government, in 1976 Indonesia became the 1st developing country which procured, owned and operated a satellite, called Palapa, as a means of its domestic communication system. The contribution of Palapa satellite for preserving the unitary State of Indonesia is really meaningful. In addition to that, the existence of the national communication infrastructures has encouraged further economic growth.

Since then, the application of space science and technology to fulfill the national needs has been developing. Such applications are range from telecommunication, remote sensing, research and observation of

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the atmosphere and ionosphere, weather forecasting, global positioning system, etc.

In order to have a description on the direction of space related activities in Indonesia, it is important to have some information regarding Indonesian space policy and institutions. Such information would lead us to understand how far space policy and institutions serve the present and future national interest and affecting the prosperity of the people.

This paper is aimed to provide participants of this workshop with a short but comprehensive picture of how the space policy has been outlined and being used as guidelines and direction for conducting space activities, also how the relevant institutions work and contribute to attain national objectives and accommodate the interest of the people.

II. INDONESIAN SPACE POLICY AND ITS IMPLEMENTATION

A. Basic Concepts in Formulating Space Policy

Paragraph 4 of the preamble of the Indonesian 1945 Constitution clearly states the objectives of establishing the unitary State of Indonesia, among others are: to promote general welfare, to promote the standard of education of the people and to maintain international order based on peace, eternal liberty/freedom / independence, and social justice. As the 1945 Constitution (as amended) is one of the primary sources of law within the framework of the Indonesian legal system, thus the norms of the constitution shall govern the formulation of any State policy, including space policy. Another consideration is, of course, the national interest in space. The pursuance of national interest in space, however, shall be conducted in such a manner that it respects the legitimate rights of other countries and the existing International Law. Moreover, the formulation process of space policy shall take into consideration the present and future development in the field of space science and technology and its applications.

B. Policy Making Forum

The highest coordinating body in formulating aerospace policy in Indonesia is the National Council for Aeronautic and Space (DEPANRI). DEPANRI was established by Presidential Decree No. 24 of 1963 as amended by Presidential Decree No. 99 of 1993. DEPANRI is chaired by the President of the Republic of Indonesia with members consisting of: The Minister of State Research and Technology (also as vice chairman and acting chairman); Minister of Foreign Affairs; Minister of Trade and Industry; Minister of Defense; and Minister of State Development Planning.

The main duty of DEPANRI is to assist the President in formulating general policy in the field of aviation and space. DEPANRI is obliged to provide consideration, opinion and advice to the President regarding legislation and utilization of air space and outer space for aviation, telecommunication and other national interests.

Since the establishment of DEPANRI, it only managed to convene 2 (two) special sessions chaired and attended by the President and all members. The 1st was held in 1994, while the second was in 1998. The 1st session was held with the objectives of discussing certain issues in the field of aviation, which were directly related to the national interests and to stipulating national program in the field of aviation and space for the 2nd Long Term Development Program (PJP II). The decisions of the first session covered, among others:

1. To develop and formulate national aerospace concept and national system in space as guidelines for designing aerospace policy and national aerospace development plan, including elaborations of rules and norms in the form of legal product;
2. To develop and promote aerospace manufacturing and service industry;
3. To conduct scientific research and development;
4. To promote the quality of human resource in the utilization, development and mastering of aerospace science and technology;

5. To develop relevant laws and regulations to encourage national aerospace efforts and securing its achievements, also to support the effort to accommodate national interest in international forum, especially international recognition of the rights to exercise national sovereignty in airspace, and to serve national interest in outer space in a comprehensive way.

An important result of the 1st session of DEPANRI was the decision that in peace situation 80% of the activities should be for commercial and 20% for military/defense, while in war situation all resource shall be mobilized for military/defense purposes.

The 2nd special session of DEPANRI was held in 1998. The objective of the meeting was to discuss and determine policy, priority and goals/targets for aerospace development in order to make progress and achieve independency in aerospace field to be contributed for national development. The purpose/significance of the meeting was as a legitimating of the results of the 1st National Aerospace Congress held in the same year.

Another important forum in discussing and outlining the space policy is the National Aerospace Congress. The 1st National Aerospace Congress was held in 1998. All stakeholders in aerospace activities attended the Congress. Not only governmental agencies participated in the congress but also private entities, researchers, experts, intellectuals and individuals. Some fundamental and important issues were agreed during the congress covering, among others:

1. National Aerospace Concept, as an elaboration of perception and attitude of the nation in dealing with the utilization of aerospace as manifestation of its national interest in aerospace;
2. General Policy for the 2nd Long Term Development Program;
3. The amended national position on the matter of geo-stationary orbit in line with the dynamic development of the issues;
4. Law reform, especially in national space legislation program by ratifying relevant international legal instruments for space

activities, enactment of national space act and determination of national position on definition/delimitation of outer space;

5. Policy on International Cooperation

During the congress, discussion was also devoted on some strategic issues which needed to be observed, including the recent international trends and development, such as: implementation of satellite-based aviation system; the possible impact of the International Space Station operation; commercialization of space activities; the increasing utilization of earth-orbits/spectrum resource; the latest development of space transportation system; atmosphere and ocean observation; space exploration; micro-sat and international cooperation.

C. National Space Legislation

In an attempt to develop national space legislation as a part of national legal system, some necessary steps have been taken which include but not limited to:

1. **Transforming relevant international legal instruments related to space activities into a part of national law.**

As far as international legal instruments related to space activities is concerned, Indonesia has ratified almost all space treaties, namely:

- a. Treaty on Principles concerning the activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies of 1967;
- b. Agreement on Rescue of Astronauts and Return of Objects Launched into Outer Space of 1968;
- c. Convention on International Liability for Damages Caused by Space Object of 1972;
- d. Convention on Registration of Object Launched into Outer Space of 1975.

Among the Space Treaties, the only agreement that Indonesia has not ratified is the Moon Agreement.

2. **Preparing a Series of National Space Legislation**

As a logical consequence of ratifying relevant international space treaties, at the moment a series of national space legislation is being studied and prepared. At the first step, an academic draft and a draft of national space act is being prepared and finalized. Such draft will be discussed at the 2nd National Aerospace Congress to be held in Mid December of 2003. Such draft of National Space Act is designed to be comprehensive and taking into considerations the present and future development of space activities which would involve “national activities” of Indonesia, including but not limited to formulating rules governing participation of private entities in space commercialization ventures.

The important issues to be covered by the draft of national space act would include:

a. Terminology and definition

It will elaborate certain terminologies and definitions to be used in the draft of national space act.

b. The Legal Status of Outer Space, including the Moon and other Celestial Bodies

It will confirm the status and legal regime applies to outer space, including the moon and other celestial bodies as referred to existing international space treaties.

c. The Safety of the Space Mission in relation with the creation of National Licensing System

In a way to guarantee the safety of any space mission, a high standard of safety regulations will be implemented. Furthermore, a national licensing system will be established for procurement, launching, deployment and operation of space related activities.

d. The National Security

In the draft of national space act there will be an emphasize that any activities related to Indonesia, either conducted from the Indonesian territory or from outside involving “Indonesian

Nationals” shall take into serious consideration the interest of national security. National security in this context refers to sovereignty and territorial integrity. Therefore, a kind of security test will be imposed to the license applicant.

e. Rules and Procedures for State Responsibility and International and National Liability System

As the existing space law has the characteristic of government to government basis, a set of rules and procedures will be implemented to deal with the issues of state responsibility and international liability for space activities, either conducted by governmental institution, private entities and even individuals. In addition to that, a national liability system shall also be established to guarantee a prompt, effective and adequate settlement of compensation to the potential or actual victims of space activities. Thus, there will be more victims-oriented.

f. National Registration System

Regulation concerning national registration system for object launched into outer space will be formulated in the draft national space act as registration of object launched into outer space is closely related to jurisdiction and control over such object. Certain national institution will be assigned to coordinate registration of object launched into outer space, either in the framework of Space Treaty and Registration Convention or in the framework of ITU.

g. Institutional Issue

Institutional issue is a very important issue to be resolved, especially in relation with coordination among relevant governmental institutions/ agencies. This issue will be carefully formulated in the draft national space act.

h. International Cooperation

Considering the importance of promoting and encouraging international cooperation in space activities to accommodate

national interest in space, the draft shall contain regulations concerning methods and requirements for international cooperation. By promoting international cooperation, it is expected that national interest in the utilization of space science and technology, transfer of technology and developing genuine capabilities in space activities might be well served.

- i. Environmental Protection
With the understanding that space science and technology shall contribute to humanity, the coming regulation of space activities shall be “environmental-oriented” rather than “use-oriented” to secure sustainable development.
- j. Protection of Intellectual Property Rights
Realizing that space activities might involve the application of high technology and new inventions, it is the duty of the Government of Indonesia to properly protect intellectual property rights relevant to space activities, both domestic and foreign property rights. Such protection shall be reflected in the formulation of the draft national space act.
- k. Participation of Private Entities in Space Activities
In line with the trends of increasing role of private sectors in space activities, the draft of national space act will regulate procedures and mechanism for participation of private sectors in space activities. Such provisions will also cover rights as well obligations/liability of private sectors for its activities.
- l. Dispute Resolution Mechanism
Theoretically, in parallel with the rapid growth of space activities it will create more variable of disputes. To anticipate such possible situation, an effective and fair dispute resolution mechanism for space activities is required. Such dispute settlement mechanism shall cover administrative, technical and legal disputes. The existence of effective and

fair dispute resolution mechanism will secure and boost orderly space activities.

D. Implementation of Space Policy

As a developing nation with limited financial resource, Indonesia faces a lot of constraints in implementing its space policy. Moreover, multidimensional crisis faced by Indonesia since 1997 has deteriorated its capabilities to achieve its space targets, priorities and programs. Therefore, the emphasis of national space activities relevant to national development has been placed on the application of space technology to enhance the welfare of all Indonesian people and on other space-related efforts required for the sustainability of such activities. Owing to its specific conditions and geographical location, Indonesia views space technology and its applications as a powerful and efficient tool that can make a significant contribution to solve the multitude of development problems confronting the countries.

In general, applications of space technology as an implementation of the national space policy can be described as follows:

1. Telecommunication

At the moment, some Indonesian legal entities, both state-owned enterprises and private legal entities are operating telecommunication satellites, such as: 2 Palapa B satellites series; 1 Palapa C satellite; Indostar (Cakrawarta) satellite for direct television broadcasting; Telkom-1 satellite for fixed communication, broadcasting and mobile; Garuda-1 satellite for personal global mobile communication.

2. Remote Sensing Applications

Practical applications of remote sensing data to be used for:

- a. Inventory of irrigated rice field;
- b. Forest mapping and monitoring;
- c. Mangrove forest inventory;
- d. Coral reef mapping;
- e. Mapping of sea surface monitoring;
- f. Forest fire detection and monitoring;

- g. Drought monitoring;
 - h. Inter-tropical convergence zone monitoring and cloud cover mapping;
 - i. Outgoing long-wave radiation mapping and monitoring;
 - j. Flood monitoring and flood susceptibility assessment;
 - k. Identification of potential fishing zone.
 3. Research and Observations of the Atmosphere and Ionosphere
 - a. Research and modeling of the Indonesian Climate;
 - b. Research and observation of the ionosphere and upper atmosphere.
 4. Global Positioning System Applications
 5. Space Technology Development

Indonesia is now giving attention to the possibility of small satellite development for various applications.

As a part of its policy to promote international cooperation, Indonesia opens the possibility to use its territory for conducting space activities. As an example, a Memorandum of Intention has been signed in Moscow between President Megawati and President Putin to use Biak Airport in Papua as an intermediate air launch bases. Furthermore, opportunity is opened for private entities of both countries to participate in this venture. At the moment, some regulatory preparations are being discussed and prepared between them for the realization of the project.

III. INDONESIAN RELEVANT INSTITUTIONS RELATING TO SPACE ACTIVITIES

Some relevant institutions involved in space related activities include governmental institutions and non-governmental institutions.

A. Governmental Institutions

1. The National Aeronautic and Space Council (DEPANRI)
As explained previously, DEPANRI is the Highest Coordinating Body with the main function to formulate the policy regarding

the utilization national air space and outer space for aviation, telecommunication and other national interest. It also provides considerations, opinion and advices to the President regarding regulations and utilization of air space and outer space.

2. The National Institute of Aeronautics and Space (LAPAN)

LAPAN acts as a national focal point in conducting research and development related to the peaceful uses of outer space. LAPAN is directly responsible to the President of Indonesia while its activities are technically coordinated by the Ministry of State for Research and Technology. Its main function includes the utilization of remote sensing satellite data and undertaking activities related to research and observations of the atmosphere/ upper atmosphere.

3. Other Governmental Institutions

Other governmental institutions involve in space technology applications are: The National Coordinating Agency for Surveying and Mapping (BAKOSURTANAL); The Meteorological and Geophysical Agency (BMG); The Agency for the Assessment and Application of Technology (BPPT); The Indonesian Institute of Sciences (LIPI).

B. Non-Governmental Institutions

Generally, there is a tendency that non-governmental institutions play increasing role in conducting related activities in space. This tendency also applies to some non-governmental institutions in Indonesia. Among them, the 2 (two) organizations, which are very active, are: Indonesia Satellite Association (ASSI) and Indonesia Infocom Society (MASTEL).

1. The Indonesian Satellite Association (ASSI)

ASSI was at first an association of satellite operators in Indonesia which was established by 5 (five) satellite operators: TELKOM; INDOSAT; Pasifik Satelit Nusantara (PSN); Media Citra Indostar (MCI) and Aces. The membership of ASSI also widely

opens for foreign operators, private entities, professionals, experts, academicians and Individuals. ASSI has received broad recognition both from government and private sectors. It also contributes substantially to the formulation of space policy and regulations. ASSI conducts regular training on space technology and relevant regulatory issues and issues certification for space related product and process.

2. The Indonesian Information and Communication Society (MASTEL)

The convergence of telecommunication (including space communication), information and computer into telematic has brought new services in addition to conventional services. Such new services include: multimedia services; video on demand; tele-education; tele-medicine; voice over internet protocol; video-conference, etc. Consequently, this has emerged new players in these ventures. MASTEL is an organization established by the information and communication society, including associations of telecommunication operators; internet service provider; content provider; computer vendors; professionals etc. MASTEL, so far has contributed substantially in shaping Indonesian telecommunication law, cyber law, broadcasting law etc. Thus, this makes it an important organization. The Representatives of MASTEL also have a seat at the telecommunication independent regulatory body (BRTI) and the Independent Broadcasting Commission (KPI). As a dialog partner of the government, the government seriously considers opinions of MASTEL.

C. The Issues of Institutional Coordination

One of the biggest problems confronting the implementation of space policy is the lack of coordination among relevant institutions. Overlapping among different institutions sometimes takes place as regulations concerning their main functions are unclear and it will create different interpretation. The draft of National Space Act is expected to touch and overcome the lack of coordination issue by

clearly defining the task, function and obligation of each institution and formulating coordination mechanism among them.

IV. CONCLUDING REMARKS

- A. As a country with specific geographical situation, Indonesia relies upon application of space science and technology to preserve its unity and promote prosperity.
- B. Based on its present and future national interests, Indonesia's national space policies, priorities and programs have been outlined by policy making forum.
- C. Financial constraints and lack of coordination among relevant institutions create difficulties in fully implementing national space policies.
- D. Efforts toward developing national space law as a part of national legal system is underway and showing some progress, including ratifying relevant international legal instruments and finalization of a draft of national space act.
- E. There is a need for reorientation of space policies and reformation of relevant institutions in order to catch-up the recent trends and development, including commercialization, privatization and globalization of space activities.

THE DEVELOPMENT OF SPACE LAW IN INDONESIA^{*}

I. GENERAL

As an archipelagic State with specific geographical situation, Indonesia has a strong interest in mastering and applying space science and technology to fulfill the needs of its national development. To come to that end there is a requirement to develop national legal system relevant to space activities, so called “national space law”. National space law shall be developed as a part of national legal system and therefore it should be complementary and in no way in conflict with other national laws and regulations.

It is generally recognized that Indonesia has benefited from human achievement in space science and technology. In 1976 Indonesia became the 1st developing country which procured, owned and operated a satellite, called Palapa, as a means of its domestic communication system.²¹⁹ The contribution of Palapa satellite for preserving the unitary State of Indonesia is really meaningful. In addition to that, the existence of the national communication infrastructures has encouraged further economic growth.

^{*} Indonesian Law Journal, Vol. 1 No. 1”, September 2006

²¹⁹ Since then we have launched and operates subsequent generation of Palapa satellites and other satellites such as “Satelit Garuda”, “Satelit Cakrawarta”, “Satelit Telkom”. This coming October LAPAN (National Aeronautic and Space Institute) in collaboration with Technical University Berlin will operate a micro satellite called “Tub Sat”, a remote sensing satellite with the resolution of about 5 m. The satellite will be launched by the launcher from Indian Space Research Organization (ISRO)

Since then, the application of space science and technology to fulfill the national needs has been developing. Such application are range from telecommunication, remote sensing, research and observation of the atmosphere and ionosphere, weather forecasting, global positioning system, disaster mitigation, etc.

This paper is aimed at providing a general description on the Development of Space Law in Indonesia. In order to have a better picture of such development, it is important to have some understanding on national space policy, national space law and national development. National space policy has been outlined and being used as guidelines and direction for conducting space activities, also how the relevant institutions work and contribute to attain national objectives and accommodate the interest of the people, while national space law will be functioned to guarantee that space related activities can be conducted in an orderly manner and shall promote prosperity and the betterment of the society.

II. NATIONAL SPACE POLICY

A. Basic Concepts in Formulating Space Policy

Paragraph 4 of the preamble of the Indonesian 1945 Constitution clearly states the objectives of establishing the unitary State of Indonesia, among others are: to promote general welfare, to promote the standard of education of the people and to maintain international order based on peace, eternal liberty/freedom/independence, and social justice. As the 1945 Constitution²²⁰ is one of the primary sources of law within the framework of the Indonesian legal system, thus the norms of the constitution shall govern the formulation of any State policy, including space policy. Another consideration is, of course, the national interest in space. The pursuance of national interest in space, however, shall be conducted in such a manner that it respects the legitimate rights of other countries and the existing International Law. Moreover, the formulation process of space policy shall take into

²²⁰ As amended four (4) times.

consideration the present and future development in the field of space science and technology and its applications.

B. Policy Making Forum and National Space Policy

The highest coordinating body in formulating aerospace policy in Indonesia is the National Council for Aeronautic and Space (DEPANRI). DEPANRI was established by Presidential Decree No. 24 of 1963 as amended by Presidential Decree No. 99 of 1993. DEPANRI is chaired by the President of the Republic of Indonesia with members consisting of: The Minister of State Research and Technology;²²¹ Minister of Foreign Affairs; Minister of Trade and Industry; Minister of Defense; The Minister of Tourism, Post and Telecommunication;²²² and Minister of State Development Planning; and National Aeronautic and Space Institute (LAPAN).

The main duty of DEPANRI is to assist the President in formulating general policy in the field of aviation and space.²²³ DEPANRI is obliged to provide consideration, opinion and advice to the President regarding legislation and utilization of air space and outer space for aviation, telecommunication and other national interests.²²⁴

Since the establishment of DEPANRI, it only managed to convene 2 (two) special sessions chaired and attended by the President and all members. The 1st was held in 1994²²⁵, while the second was in 1998²²⁶. The 1st session was held with the objectives of discussing certain issues in the field of aviation which were directly related to the national interest; and to stipulating national program in the field of aviation and space for the 2nd Long Term Development Program (PJP II). The decisions of the first session covered, among others:²²⁷

²²¹ Also as Vice Chairman, acting Chairman and Member.

²²² Now it becomes Minister of Communication and Information (Menteri Kominfo).

²²³ Article 2 of Presidential Decree No. 99 of 1993 concerning DEPANRI.

²²⁴ Ibid, article 3.

²²⁵ For further detail, see Sekretariat DEPANRI, Laporan Sidang Paripurna Pertama DEPANRI 28 May 1994, Jakarta, 10 June 1994.

²²⁶ For further detail, see Sekretariat DEPANRI, Laporan Sidang Paripurna Kedua DEPANRI 10 December 1998, Jakarta, 15 January 1999.

²²⁷ See Sekretariat DEPANRI (1994), page 3.

1. To develop and formulate national aerospace concept and national system in space as guidelines for designing aerospace policy and national aerospace development plan, including elaborations of rules and norms in the form of legal product;
2. To develop and promote aerospace manufacturing and service industry;
3. To conduct scientific research and development;
4. To promote the quality of human resource in the utilization, development and mastering of aerospace science and technology;
5. To develop relevant laws and regulations to encourage national aerospace efforts and securing its achievements, also to support the effort to accommodate national interest in international forum, especially international recognition of the rights to exercise national sovereignty in airspace, and to serve national interest in outer space in a comprehensive way.

An important result of the 1st session of DEPANRI was the decision that in peace situation 80% of the activities should be for commercial and 20% for military/defense, while in war situation all resource shall be mobilized for military/defense purposes.²²⁸

The 2nd special session of DEPANRI was held in 1998. The objective of the meeting was to discuss and determine policy, priority and goals/targets for aerospace development in order to make progress and achieve independency in aerospace field to be contributed for national development. The purpose/significance of the meeting were as a legitimating of the results of the 1st National Aerospace Congress held in the same year.

Another important forum in discussing and outlining the space policy is the National Aerospace Congress. The 1st National Aerospace Congress was held in 1998. The Congress was attended by all stakeholders in aerospace activities. Not only governmental agencies participated in the congress but also private entities, researchers, experts,

²²⁸ Ibid.

intellectuals and individuals. Some fundamental and important issues were agreed during the congress covering, among others:

1. National Aerospace Concept, as an elaboration of perception and attitude of the nation in dealing with the utilization of aerospace as manifestation of its national interest in aerospace;
2. General Policy for the 2nd Long Term Development Program;
3. The amended national position on the matter of geostationary orbit in line with the dynamic development of the issues;
4. Law reform, especially in national space legislation program by ratifying relevant international legal instruments for space activities, enactment of national space act and determination of national position on definition/delimitation of outer space;
5. Policy on International Cooperation.

During the congress, discussion was also devoted on some strategic issues which needed to be observed, including the recent international trends and development, such as: implementation of satellite-based aviation system; the possible impact of the International Space Station operation; commercialization of space activities; the increasing utilization of earth-orbits /spectrum resource; the latest development of space transportation system; atmosphere and ocean observation; space exploration; microsat and international cooperation.

The 2nd National Space Congress was held in Jakarta on 22-24 December 2003. During the congress ten (10) strategic issues in the field of aerospace development were discussed.²²⁹ Certain strategic issues relevant to space activities include: mastering aerospace

²²⁹ The ten strategic issues covering: human resource development; law enforcement on State sovereignty in air space; mastering aerospace technology; aerospace manufacturing industry; national air space management, safety and security of air transportation; flight information region; frequency for telecommunication services, including other telecommunication activities; definition and delimitation of air space and outer space; national concept and perception on aerospace; and restructuring of DEPANRI organization. For further elaboration on the discussion of the above issues, see Sekretariat LAPAN, Laporan Kongres Kedirgantaraan Nasional Kedua, Jakarta, 22-24 December 2003, January 2004.

technology (rocket and satellite); definition and delimitation of outer space; the use of frequency for (space) communication activities.²³⁰

On the efforts to mastering space science and technology, some strategic recommendations were determined, among others: increasing the sounding rocket capabilities within 5 years to about 300 km; the use of Biak Air Field in Papua as intermediate base for Air Launch Space Transportation System (ALS); multi-purpose satellite technology development for telecommunication, defense and remote sensing application; further consideration on the possibility to join Missile Technology Control Regime (MTCR).²³¹

III. NATIONAL SPACE LAW DEVELOPMENT

In an attempt to develop national space law as a part of national legal system, considerations shall be taken to several factors, such as: national interest in space; national space policies; geographical situation of Indonesia; the trends of commercialization and privatization of space activities; protection of public interest; standard of space legislation; harmonization with both national and international legal instruments; effective law enforcement mechanism.

In the process of developing national space law, the following steps have been and shall be taken:

A. **Transforming relevant international legal instruments related to space activities into a part of national law**

As far as international legal instruments related to space activities is concerned, Indonesia has ratified almost all space treaties, namely:

- a. Treaty on Principles concerning the activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies of 1967;²³²

²³⁰ Ibid.

²³¹ For further detail, see Sekretarian LAPAN, Ringkasan Laporan Kongres Kedirgantaraan Nasional Kedua, Jakarta, 22-24 December 2003, January 2004, page 2-3.

²³² Ratified by Law No. 16 of 2002

- b. Agreement on Rescue of Astronauts and Return of Objects Launched into Outer Space of 1968;²³³
- c. Convention on International Liability for Damages Caused by Space Object of 1972;²³⁴
- d. Convention on Registration of Object Launched into Outer Space of 1975.²³⁵

Among the Space Treaties, the only agreement that Indonesia has not ratified is the Moon Agreement as it is deemed not urgent. By ratifying the above mentioned international space treaties, Indonesia has transformed the provisions of those treaties from the norms of international law into a part of national law. Consequently, every effort to formulate national space legislation shall take into consideration and subject to existing international space law. The problem is that in further development of space activities, some States tend to take different interpretation and position on some provisions of international space treaties in the process of formulating their national space legislation.²³⁶ In addition to international space treaties, some other UNGA Resolutions Governing certain Space Activities such as: Direct Television Broadcasting;²³⁷ Remote Sensing,²³⁸ Nuclear Power Sources;²³⁹ and International Cooperation²⁴⁰, shall be taken into account in formulating National Space Law and Regulations.

²³³ Ratified by Presidential Decree No. 4 of 1999

²³⁴ Ratified by Presidential Decree No. 20 of 1996

²³⁵ Ratified by Presidential Decree No. 5 of 1997

²³⁶ Concerning interpretation of international space treaties, see Supancana, "Interpretation and Implementation of International Space Treaties and Its Implications to the Formulation of National Space Legislation (An Indonesian Experience)" Paper presented at the Second Malaysia's Conference on Space Law, Kuala Lumpur, 18-19 April 2004.

²³⁷ UNGA Resolution No. 37/92 of 1982 concerning Legal Principles Governing Direct Television Broadcasting.

²³⁸ UNGA Resolution No. 41/65 of 1986 concerning Principles on Remote Sensing from Outer Space.

²³⁹ UNGA Resolution No. 47/68 of 1992 concerning Principles on Nuclear Power Sources in Outer Space.

²⁴⁰ UNGA Resolution No. 51/122 of 1996 concerning Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit of All Countries, especially those of Developing Countries.

Apart from the above “Space Treaties” some other relevant treaties should also be taken into consideration, namely: Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water of 1963 (“Partial Test Ban Treaty”); The Treaty on the Non-Proliferation of Nuclear Weapon of 1968; The Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques of 1977; The Convention on the Protection of Ozone Layer of 1985 which is followed by the Montreal Protocol on Substances that Deplete the Ozone Layer of 1987 and the London Amendment to the Montreal Protocol of 1990; Missile Technology Control Regime; Convention on International Interest in Mobile Equipment of 2001.²⁴¹

B. Principles of Formulating a National Space Legislation that comply with International Standard

We should bear in mind that in an interdependent world there is a trend toward internationalization of regulation on certain activities. Such trends also apply to space activities, in this regard national space legislation shall fulfill international standard of space legislation in order to guarantee of its effectiveness both at national and international level. One is of the opinion that in general such international standards would consist of several principles, such as:²⁴²

1. International treaties and Existing National Space Legislation as a Basis and Guidelines;
2. Balance between International Obligation and National Interests;
3. Promotion of International Cooperation;
4. Maintaining Flexibility and Constant Evolvment;
5. Gradual Process with Order of Priority.

²⁴¹ Serious attention shall be paid to the current discussion within UNIDROIT and UNCOPUOS on the Draft Protocol of Space Asset to the Convention on International Interest in Mobile Equipment of 2001, especially its possible implications to the interest of developing countries in general and Indonesia in particular. For further analysis on this issue, see Supancana, “Preliminary Draft Protocol of Space Asset: Commercial Opportunities and Challenges for Developing Countries”, *Satellite News Letter*, 2004.

²⁴² For further elaboration and analysis of these principles, see Zhao Yun, “National Space Legislation, with Reference to China’s Practice”, Paper presented at Space Law Conference 2006, 2-3 August, Bangkok, Thailand, page 8-11.

While another is the opinion that a comprehensive national space legislation shall cover the following issues:²⁴³

1. International Law Responsibility for National Activities;
2. Governmental and Private Liability;
3. Government Safety Requirements for Commercial Space Vehicles;
4. Economic Stability of the Launch Business;
5. Compliance with Environmental Laws;
6. National Security Considerations;
7. Protection of Space Investments;
8. Promotion of National Space Commerce;
9. Definition of the Boundaries of Outer Space in Order to Ascertain the Scope of National Legislation;
10. Continues Oversight of Commercial Space Activities after Launch.

C. **Academic Draft and Main Provisions of Draft National Space Act**

It is our intention that a national space act should, not only accommodate national interest and fulfill its international obligations, but shall also anticipate the current and future development of space activities which would affect national interest. As the basis of drafting national space act, an academic draft was prepared in order to provide academic background and justification to the draft of national space act. The first Academic draft was finalized by the end of 2003.²⁴⁴ Such academic draft was designed to be comprehensive and taking into considerations the present and future development of space activities which would involve “national activities” of Indonesia, including but not limited to formulating rules governing participation of private entities in space commercialization ventures. Prior to formulating

²⁴³ See Paul B Larsen, “Is National Legislation on Commercial Space Needed?”, comments to the Paper of Zhao Yun at Space Law Conference 2006, 2-3 August, Bangkok, Thailand, page 15-19.

²⁴⁴ For more elaboration of the first academic draft of national space act, see Supancana, *Pelembagaan Undang-Undang Keantariksaan Nasional*, Penerbit Mitra Karya, Jakarta, 2006, page 123-201.

academic draft of national space act, a comparative study has been conducted to existing national space legislations of several space faring countries, such as: USA, Russia, UK, France, Sweden, South Africa²⁴⁵ and lately also Australia.²⁴⁶

In general, it can be said that academic draft of national space act of Indonesia could be used as a valid basis in formulating of national space act that would satisfy relevant parameters of being a national space act of international standard.

The following are the main provisions to be covered by the draft of national space act, among others:

1. Terminology and definition

It will elaborate certain terminologies and definitions to be used in the draft of national space act such as: aerospace, outer space; space activities; space object; celestial bodies, etc.²⁴⁷

2. Primary Basis, principles and objectives

The primary basis of draft national space act is: Pancasila; the 1945 Constitution (as amended); “Wawasan Nusantara” and “Konsep Kedirgantaraan Nasional”. The principles of this draft act are, among others: Utilization; independency; flexibility, harmony. While its objective, are to provide direction and guidelines in a systematic and integrated way to all stakeholders in space activities for the prosperity of the nation, environment and humankind.²⁴⁸

3. The Legal Status of Outer Space, including the Moon and other Celestial Bodies

It will confirm the status and legal regime applies to outer space, including the moon and other celestial bodies as referred to existing international space treaties.²⁴⁹

²⁴⁵ For further analysis of national space legislations in USA, UK, France, Sweden and South Africa, see Supancana, “Undang-Undang Keantariksaan Beberapa Negara (Suatu Perbandingan)”, paper presented at Interdepartmental working group on drafting national aerospace act, Cisarua, 21-22 December 1999.

²⁴⁶ See Paul B Larsen, *op.cit*, page 11-15.

²⁴⁷ See Supancana, *Pelembagaan Undang-Undang Keantariksaan Nasional*, *op.cit*, page 186-187.

²⁴⁸ *Ibid*, page 187-188.

²⁴⁹ *Ibid*, page 188.

4. The Safety of the Space Mission in Relation with the Creation of National Licensing System

In a way to guarantee the safety of any space mission, a high standard of safety regulations will be implemented. Furthermore, a national licensing system will be established for procurement, launching, deployment and operation of space related activities.²⁵⁰

5. The National Security

In the draft of national space act there will be an emphasize that any activities related to Indonesia, either conducted from the Indonesian territory or from outside involving “Indonesian Nationals” shall take into serious consideration the interest of national security. National security in this context refers to sovereignty and territorial integrity. Therefore, a kind of security test will be imposed to the license applicant.

6. Rules and Procedures for State Responsibility and International and National Liability System

As the existing space law has the characteristic of government to government basis, a set of rules and procedures will be implemented to deal with the issues of state responsibility and international liability for space activities, either conducted by governmental institution, private entities and even individuals. In addition to that, a national liability system shall also be established to guarantee a prompt, effective and adequate settlement of compensation to the potential or actual victims of space activities.²⁵¹ Thus there will be more victims-oriented.

7. National Registration System

Regulation concerning national registration system for object launched into outer space will be formulated in the draft national space act as registration of object launched into outer space is closely related to jurisdiction and control over such object. Certain national institution will be assigned to coordinate registration

²⁵⁰ Ibid, page 189-190.

²⁵¹ Ibid, page 190-192.

of object launched into outer space, either in the framework of Space Treaty and Registration Convention, in the framework of ITU²⁵² and possibly in the framework of would Protocol of Space Asset to the Convention on International Interests in Mobile Equipment (Cape Town Convention 2001).

8. Institutional Issue

Institutional issue is a very important issue to be resolved, especially in relation with coordination among relevant governmental institutions/agencies. This issue will be carefully formulated in the draft national space act.²⁵³

9. International Cooperation

Considering the importance of promoting and encouraging international cooperation in space activities to accommodate national interest in space, the draft shall contain regulations concerning methods and requirements for international cooperation. By promoting international cooperation, it is expected that national interest in the utilization of space science and technology, transfer of technology and developing genuine capabilities in space activities might be well served.

10. Environmental Protection

With the understanding that space science and technology shall contribute to humanity, the coming regulation of space activities shall be “environmental-oriented” rather than “use-oriented” to secure sustainable development.²⁵⁴

11. Protection of Intellectual Property Rights

Realizing that space activities might involve the application of high technology and new inventions, it is the duty of the Government of Indonesia to properly protect intellectual property rights relevant to space activities, both domestic and foreign property

²⁵² Ibid, page 192.

²⁵³ Ibid, page 193.

²⁵⁴ Ibid, page 193-194.

rights. Such protection shall be reflected in the formulation of the draft national space act.²⁵⁵

12. Participation of Private Entities in Space Activities

In line with the trends of increasing role of private sectors in space activities, the draft of national space act will regulate procedures and mechanism for participation of private sectors in space activities. Such provisions will also cover rights as well obligations/ liability of private sectors for its activities.²⁵⁶

13. Dispute Resolution Mechanism

Theoretically, in parallel with the rapid growth of space activities it will create more variable of disputes. To anticipate such possible situation, an effective and fair dispute resolution mechanism for space activities is required. Such dispute settlement mechanism shall cover administrative, technical and legal disputes. The existence of effective and fair dispute resolution mechanism will secure and boost orderly space activities.²⁵⁷

14. Sanction for Non-Compliance

Sanction for non-compliance to rules and regulations on space activities would include: administrative sanction, civil law and even criminal law sanction.²⁵⁸

At the moment, an interdepartmental working group is still working on finalizing draft of national space act and makes some adjustment to the academic draft accordingly. It is scheduled that the draft national space act will be discussed and to be passed by Parliament in 2008.

Considering the ongoing intensive discussion between Russia and Indonesia, both at governmental level and private level, regarding space cooperation agreement, especially the realization of cooperation to develop and operate Air Launch Space Transportation System (ALS),

²⁵⁵ Ibid, 194.

²⁵⁶ Ibid, page 194-195.

²⁵⁷ Ibid, page 195-196.

²⁵⁸ Ibid, page 196.

some other relevant national laws and regulations shall be formulated, harmonized, reviewed and/or adjusted.

IV. CONCLUDING REMARKS

- A. As National Space Law is a part of National Legal System, it shall be developed in such a way that it is not in contrary, but complementary to existing laws.
- B. The development of Space Law in Indonesia, including the formulation of draft national space act, shall take into consideration national interest, international obligations, and present and future development of space activities, including the trend of commercialization and privatization of space activities.
- C. National Space Law shall be developed in line with National Space Policy.
- D. National Space Law shall be functioned to encourage and secure an orderly implementation of space policies for the prosperity of the nation based on justice, fairness and legal certainty.

INTERNATIONAL DISASTER RESPONSE LAW, RULES AND PRINCIPLES (IDRL) PROGRAM OF THE INTERNATIONAL FEDERATION OF RED CROSS AND RED CRESCENT SOCIETES (IFRC)*

I. INTRODUCTION

A. The Facts on Disaster and Its Responses

We can witness that every year millions of people are affected by natural and man-made disaster, and every year the international community is faced with the challenge of responding to crisis that exceeds the capacities of national infrastructure. Currently no well recognized and comprehensive legal instruments which identify internationally agreed rules, principles and standards for the protection and assistance of people affected by natural disaster²⁵⁹. Consequently, many international disaster response operations are subject to ad hoc rules and systems, which vary dramatically from country to country and impede the provision of fast and effective assistance putting lives and dignity at risk²⁶⁰.

* Paper presented at Conference on Space Law and Space Applications for Disaster Management in the Asia Pacific Region, Bangkok, Thailand, 22 November 2007

²⁵⁹ Compare to David P Fidler, "The Indian Ocean Tsunami and International Law", ASIL Insight, 2005, page 1-2. He among other stated "No definite, broadly accepted sources of International Law which spells out legal standards, procedures, rights and duties pertaining to disaster management".

²⁶⁰ See International Disaster Response Law (IDRL) Appeal No. 01.100/2004, page 1.

B. Ideal Conditions for Disaster Preparedness

By considering the above facts on disaster and its response, there is a need to create ideal conditions for disaster preparedness which would: ensure preparedness both at local, national and international level; anticipate to the likely needs of the affected communities; the ability to identify potential legal and administrative challenges for the entry and coordination as a way to overcome it; and prevent unnecessary obstacles both legal, policy and institutional²⁶¹.

C. Problems in International Disaster Response

It is important to have understanding on the problems in international disaster response in the efforts to achieve the above-mentioned ideals. The problems that commonly faced are among others:

1. Delayed or even prevented from providing initial relief and operations. One examples of it can be observed during the Tsunami in the end of 2004 where they were lacks of early warning, alert and preparedness among the affected countries²⁶².
2. Ill equipped national legal and regulatory system to deal with the needs of international relief provider²⁶³.
3. Lacks of awareness among countries/governments about the importance of international cooperation that should override or overcome political or ideological differences and even legal or administrative obstacles in case of disaster (both natural and technological disaster).

²⁶¹ Compare to the definition of “Disaster Preparedness” as formulated in Glossary of Strategy 2010, of which disaster preparedness is defines as: “Activities that contribute to the pre-planned, timely and effective response of individuals and communities to withstand, reduce the impact and deal with the consequences of a (future) disaster”.

²⁶² See David P Fidler, loc.cit.

²⁶³ For example, Indonesia, the most affected State stroked by Tsunami in 2004, only have a comprehensive law on disaster management that could accommodate the interest of international relief provider in 2007.

II. THE IDEA AND ESTABLISHMENT OF IDRL PROGRAM

A. Background

The idea of establishing IDRL program was to response the growing concern within the international community as to the adequacy of existing legal and other mechanism to facilitate humanitarian activities in response to both natural and technological disaster. Based on a study, there were some findings concerning identified key deficiencies on existing international legal instruments relevant to disaster relief, such as²⁶⁴:

1. Regional disparities in the existence of treaties relevant to disaster relief;
2. Diversity in the content of treaties relating to disaster relief;
3. Disparate and inconclusive legal principles on disaster relief; and
4. Significant aspects of disaster relief not properly addressed.

IDRL was initiated by the International Federation of Red Cross and Red Crescent Societies (International Federation) in 2001.

B. The Overall Goal

The overall goals of IDRL Program are²⁶⁵:

1. Save losses of live caused by disaster;
2. Reduce the suffering and vulnerability of disaster victims; and
3. Reduce losses of assets and negative impact on living conditions and livelihood.

C. The Objectives

There are some key objectives of the IDRL Program, covering²⁶⁶: to raise awareness about the existing norms and standards governing international disaster response and to strengthen the international, regional and national frameworks of laws, rules, and principles that pertain to facilitation, coordination and regulation of international

²⁶⁴ See International Federation of Red Cross and Red Crescent Societies, IDRL Legal Research: research into Existing IDRL Treaties, IDRL Fact Sheet No 6, March 2003.

²⁶⁵ See IDRL Appeal No. MAA00004, 2006-2007, page 2.

²⁶⁶ See Ibid, page 5.

response to disaster; to facilitate access to legal and policy instruments form humanitarian response actors, disaster managers and policy makers; to promote the implementation of existing IDRL instruments and make their content tangible for humanitarian response actors; assist red cross/red crescent national societies in providing to their government with regard to strengthening the disaster management legal and policy framework in their country; identify problems which remain unaddressed in existing IDRL instruments and facilitate a dialogue about finding solutions.

D. The Focus

The focuses of the IDRL Program will be on the legal issues arising from international response to different types of non-conflict related disasters, as well as technological, chemical and biological disasters. In that respect IDRL Program seeks to: raise awareness of applicable normative standards and promote their effective implementation; identify gaps and weaknesses in current regulatory structures at the national, regional and international levels; and promote dialogue in finding solutions.

III. RELEVANT INTERNATIONAL LEGAL INSTRUMENTS RELATED TO DISASTER MANAGEMENT

There are some existing relevant international legal instruments related to disaster management, among others:

- A. Convention establishing an international relief union of 1927;
- B. Convention on assistance in the case of nuclear accident or radiological emergency of 1986;
- C. Convention on early notification of a nuclear accident of 1986;
- D. Council's of Europe Agreement on the Prevention of, Protection against, and Organization of Relief in Major Natural and Technological Disaster of 1987;
- E. Convention on Temporary Admission of 1990 (in particular annex B.9 concerning goods imported for humanitarian purposes);
- F. Inter-American Convention to Facilitate Disaster Assistance of 1991;

- G. The Tampere Convention on the Provisions of Telecommunication Resources for Disaster Mitigation and Relief Operations of 1998²⁶⁷.
- H. The International Convention on the Simplification and Harmonization of Customs Procedures as amended in 1999.
- I. Framework Convention on Civil Defense Assistance of 2000.
- J. The “Seville Agreement” on the Organization of International Activities of the Components of the International Red Cross and Red Crescent Movement of 1997.

Other relevant legal documents, including but not limited to:

- A. Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disaster of 2000²⁶⁸.
- B. The statutes of the International Red Cross and Red Crescent Movement as amended in 1995.
- C. The Principles and Rules of Red Cross and Red Crescent in Disaster Relief as amended in 1995.
- D. The Supplementary measures to enhance the implementation of the Seville Agreement of 2005.
- E. The Hyogo Framework for Action of 2005.
- F. The Measures to Expedite International Relief of 1977.
- G. UNGA Resolution 46/182 of 1991.
- H. UNGA Resolution 57/150 of 2002.
- I. Etc.

²⁶⁷ The Tampere Convention entered into force on 8 January 2005 following the ratification by 30th country. The Tampere Convention is a legally binding international instrument aimed at helping relief workers brings telecommunication equipment across borders during and after an emergency, with a minimum difficulty.

²⁶⁸ The Charter, known as International Charter “Space and Major Disaster” was initiated by the European Space Agency (ESA) and the France Space Agency (CNES) which was declared formally operational on November 1 of 2000. Some major space agencies from space faring nations such as: USA (NOAA), Canadian Space Agency (CSA), India (ISRO), Japan (JAXA) have also become members. Further information about “the Charter on Space and Major Disaster”, read Joanne Gabrynowicz, “Comments on the Discussion Paper: Space Contribution for Disaster Management, Legal Framework”, with Specific Emphasis on the Disasters Charter”, presented at The Space Law Conference 2006, Asian Cooperation in Space Activities: A Common Approach to Legal Matters, Bangkok 2006.

The above-mentioned international legal documents, both in the form “hard laws” and “soft laws”, not only complementary one another but also form a harmonious and comprehensive system laws, rules and principles that eventually contribute to humanity, in particular protect and accommodate the needs and interests of victims of disasters.

IV. SOME CHALLENGES IN IMPLEMENTING IDRL

There are some challenges in implementing IDRL Program, particularly the problems that frequently faced in the past experiences regarding international disaster relief and initial recovery assistance. Some of the problems are related to the following issues²⁶⁹:

A. Personnel

In practical situation personnel movement and qualification are often faced by the following situation:

1. Delayed or refused entry permission/visas for relief workers
2. Legal difficulties in hiring local staffs and volunteers
3. Lacks of legal protection, privileges and immunities for relief workers
4. Lack of recognition of professional qualifications of relief workers.

B. Legal Status of Foreign Organization

For foreign organizations who conducting disaster relief and initial recovery assistance some difficulties shall be lifted such as:

1. Lengthy procedures for gaining legal status to operate in foreign country
2. Difficulties in transferring/exchanging money and opening bank accounts
3. Vulnerability to false legal claims, arrest, detention and seizure of property
4. Restriction in carrying out mandates.

²⁶⁹ See IDRL Fact Sheet as quoted from www.ifrc.org.

C. Goods and Equipments

Facilitation of goods and equipment in disaster relief and initial recovery assistance is absolutely required, this is very important to overcome the following situation:

1. Delays in the import, export and transit of relief goods, medicine and equipments
2. Imposition of taxes, fees and tolls on relief activities
3. Restricted use of communication equipments
4. Difficulties with use of vehicles, aircraft and shipping.

D. Coordination, Quality and Accountability

Coordination, quality and accountability are key success factors in the whole process of disaster relief and initial recovery operation therefore certain situations shall be prevented or minimized, such as:

1. Inadequate information-sharing about disaster and the humanitarian needs
2. Sending unnecessary or inappropriate relief items and assistance
3. Undervaluing local knowledge and response capacities
4. Use of untrained or unqualified personnel
5. Lack of adherence to quality/accountability standard.

Apart from the above challenges, some other major challenges may be faced in disaster relief and initial recovery operation, particularly in implementing IDRL, these challenges would include²⁷⁰:

1. Inconsistent access to disaster affected people.
2. Delays and inefficiency in facilitating disaster response.
3. Gaps in the use of quality and accountability standards.
4. Lack of national and international coordination.

The above challenges should be seriously taken into considerations in the efforts to implement IDRL. Narrowing the gaps between national

²⁷⁰ For further detail, read Nick Carter, "Legal Protection for Disaster Affected People", unpublished, page 1-2.

law and international law would be of importance to lift identified obstacles. In addition, continues dialogue will bring more mutual understanding among members of the international community. Developing a culture of caring to each others' sorrow would also help the international community to find satisfactory solutions to existing and future legal, policy and institutional constraints in providing international disaster relief and initial recovery assistance to the affected victims and areas.

V. DRAFT GUIDELINES FOR THE DOMESTIC FACILITATION AND REGULATION OF INTERNATIONAL DISASTER RELIEF AND INITIAL RECOVERY ASSISTANCE²⁷¹

The purpose of the guidelines is to contribute to national legal preparedness by providing guidance to States interested in improving their domestic legal, policy and institutional framework concerning international disaster relief and initial recovery assistance²⁷². In terms of scope, the guidelines are not intended to apply to situations of arms conflict or disasters that occur during arms conflict, or to imply changes in any rules governing relief in those contexts²⁷³. Some definitional issues are clarified by the draft guidelines, especially on some terminologies, such as: disaster; disaster relief; initial recovery assistance; goods; services; equipment; personnel; affected state; assisting state; originating state; transit state; assisting humanitarian organization; eligible assisting humanitarian organization; assisting actor; etc²⁷⁴.

The legal status of the proposed Guidelines would be: non-binding, complementary to the existing international law; and to fill the gap of the existing laws, rules and principles.

The draft Guidelines contain important provisions, such as:

²⁷¹ Version of 26 October 2007. The draft Guidelines was expected to adopted as one of the resolution of the 30th International Conference of the Red Cross and Red Crescent.

²⁷² See point 3.3 of the Guidelines.

²⁷³ Ibid, point 3.4. The provisions of these Guidelines are also not intended to recommend any changes to, or affect the meaning or implementation of, any existing international law or agreements.

²⁷⁴ For further details of the above definitions, see Draft Guidelines point 2.1- 2.14.

A. Core Responsibilities

The responsibilities of affected States are to ensure disaster risk reduction, relief and recovery assistance in their territory²⁷⁵. In case a disaster situation exceeds national coping capacities, it should seek international and/or regional assistance to address the needs of affected persons²⁷⁶.

Meanwhile assisting actors should abide by the laws of affected States and applicable international law, coordinate with domestic authorities, and respect the human dignity of disaster affected persons at all times. Assisting actors should also conduct their activities in accordance with the principle of humanity, neutrality and impartiality²⁷⁷.

All States have additional responsibility to actively encourage members of the public interested in contributing to international disaster relief or initial recovery to make financial donations²⁷⁸. All States (parties) should cooperate to prevent unlawful diversion, misappropriations, or fraud concerning disaster relief or initial recovery of goods, equipment or resources and initiate proceedings as appropriate²⁷⁹.

B. Early Warning and Preparedness

On early warning system, States should have procedures in place to facilitate the expeditious sharing of information about disasters²⁸⁰. Concerning legal, policy and institutional frameworks, States should adopt a comprehensive legal, policy and institutional frameworks and planning for disaster prevention, mitigation, preparedness, relief and recovery which took full account of the auxiliary role of their national red cross and red crescent societies²⁸¹. In order to promote early warning and preparedness system, there is a need for regional and international

²⁷⁵ See Draft Guidelines, *ibid*, point 3.1.

²⁷⁶ *Ibid*, point 3.2.

²⁷⁷ *Ibid*, point 4.1 and 4.2.

²⁷⁸ *Ibid*, point 5.2.

²⁷⁹ *Ibid*, point 6.1.

²⁸⁰ For further detail see *ibid*, point 7.

²⁸¹ See *Ibid*, point 8.1.

support for domestic capacities. In that respect the international community, including donors, regional and other relevant actors, should support developing States, domestic civil society actors and national red cross and red crescent societies to build their capacities to prevent, mitigate, prepare for and responds to disaster domestically²⁸².

C. Initiation and Termination of International Disaster Relief and Initial Recovery Assistance

Disaster relief or initial recovery assistance should be initiated only with the consent of affected States and in principle, on the basis of an appeal²⁸³. Request and offers for assistance should be as specific as possible as to the types and amounts of goods as well as the services and expertise available or required, respectively²⁸⁴. Affected should make available to assisting actor's adequate information about domestic laws and regulations of particular relevance to the entry and operation of disaster relief or initial recovery assistance²⁸⁵.

In the event of initiation of military relief, military assets should be deployed for disaster relief or initial recovery assistance only at the request or with the express consent of affected States²⁸⁶. When the affected States or an assisting actor intends to terminate disaster relief or initial recovery operation, it should provide appropriate notification²⁸⁷.

D. Eligibility for Legal Facilities

Transit and affected States are recommended to grant legal facilities to assisting States with respect to disaster relief and initial recovery assistance²⁸⁸. It is the prerogative of originating, transit and affected States to determine which assisting humanitarian organizations will be eligible to receive the legal facilities with respect to their disaster relief

²⁸² See *Ibid*, point 9.1 and 9.2.

²⁸³ *Ibid*, point 10.1.

²⁸⁴ *Ibid*, point 10.2.

²⁸⁵ *Ibid*, point 10.3.

²⁸⁶ *Ibid*, point 11.

²⁸⁷ *Ibid*, point 12.

²⁸⁸ *Ibid*, point 13.

or initial recovery assistance²⁸⁹. Affected States may also wish to extend, upon request, some of the legal facilities to other assisting actors, for example to private companies providing charitable relief operations of assisting humanitarian organizations or assisting States²⁹⁰.

E. Legal Facilities for Entry and Operations

For the purpose of conducting disaster relief and initial recovery assistance affected States should grant, to relevant personnel, visas and any necessary working permit, temporary licenses, certificates that are necessary for the performance of disaster relief or initial recovery assistance, and also freedom of access²⁹¹.

Goods and equipment shall be exempted from all customs duties, taxes, tariff or governmental fees; exempted from all export, transit and import restrictions; simplify and minimize document requirements. There must be also waived or reduced from inspections requirements. For special goods and equipments, affected States should grant temporary recognition to foreign registration and plates with regard to vehicles imported by them, they also have to grant any applicable licenses and reduce any barriers²⁹².

In order to facilitate transportation of goods and equipments for disaster relief or initial recovery assistance, originating, transit and effected States should grant without undue delay, permission for the speedy passage of land, marine and air vehicles operated by an assisting State or eligible assisting humanitarian organization or on its behalf, ideally waive applicable fees²⁹³. Temporary domestic legal status should be granted by affected States to relevant entities of assisting States and eligible assisting humanitarian organizations, upon entry or as soon as possible thereafter, to open bank accounts, enter into contract and leases, acquire and dispose of property and instigate legal proceedings for the purpose of providing disaster relief

²⁸⁹ Ibid, point 14.1.

²⁹⁰ Ibid, point 15.

²⁹¹ Ibid, point 16.1. a, b, and c.

²⁹² For further detail, see Ibid, point 17 and 18.

²⁹³ See Ibid point 19.

and initial recovery assistance²⁹⁴. On the taxation issues, affected States should provide exemptions to assisting States and eligible assisting humanitarian organizations from value-added and other taxes or duties directly associated with disaster relief and initial recovery assistance²⁹⁵.

Appropriate measures should be taken by affected States to address the safety and security of disaster relief and initial recovery personnel of assisting States and eligible assisting humanitarian organizations and of the premises, facilities, means or transport, equipments and goods used in connection with their activities²⁹⁶. Affected States should endeavor to ensure, when necessary, that State-operated offices and services essential to the timely delivery of international disaster relief function outside of normal business hours²⁹⁷. The cost of providing international disaster relief or initial recovery assistance should normally be borne by the assisting States or assisting humanitarian organizations, but upon agreement with affected States certain cost can be reimbursed²⁹⁸.

VI. THE WAY FORWARD

- A. There is a need for the same level of perceptions and awareness among international community's (covering the governments, international organizations and community at large) concerning the importance of international cooperation in case of disaster.
- B. There is a need for socialization to achieve the above objectives.
- C. There is a need for harmonization between national law and international law to deal with the issue of implementing IDRL.
- D. There is a need to develop IDRL as an integrated approach in dealing with disaster related issues.

²⁹⁴ Ibid, point 20.

²⁹⁵ Ibid, point 21.

²⁹⁶ Ibid, point 22.

²⁹⁷ Ibid, point 23.

²⁹⁸ Ibid, point 24.

- E. International community shall cooperate in finalizing guidelines for the domestic facilitation and regulation of international disaster relief and initial recovery assistance.
- F. Strong commitment from international community's lead by governments is the key factor to achieve the above goals.

**PROGRESSIVE DEVELOPMENT OF
OUTER SPACE LAW: HOW IT AFFECTS
THE FORMULATION OF NATIONAL SPACE
LEGISLATION (SOME LESSON LEARNED
FROM THE EXPERIENCE OF INDONESIA IN
FORMULATING THE LAW NUMBER 21 OF
2013 CONCERNING SPACE ACTIVITIES)***

I. INTRODUCTION

The process of formulating national space legislation in Indonesia has taken quite some time. After more than a decade of deliberations, Indonesia finally has enacted a law concerning space activities, namely Law No. 21 of 2013.

Such a long process have to be passed not only to accommodate national vision and legitimate national interest, but also to harmonize with Indonesian international obligations as reflected in international legal instruments, both in the form of international treaties reflecting progressive development of international space law, as well as in other forms of soft law and even the new development and standards of outer space law as

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shown in the practices of other countries in formulating their national space legislations.

This paper is prepared to explore how the progressive development of outer space law affecting the process of formulating national space legislation, in this case as experienced by Indonesia in formulating its national space legislation and some lesson learned that could be shared to other countries.

II. THE TRANSFORMATION OF CORE PRINCIPLES OF OUTER SPACE LAW INTO NATIONAL SPACE LEGISLATION

A. Core Principles of Outer Space Law and Other Relevant International Legal Instruments

The core principles of outer space law are laid down in the following classification:

1. **The Principles as Formulated in Existing Space Treaties**
The main principles are stated in the Space Treaty of 1967 as Magna Charta of Space Activities while the more specific principles are elaborated in some other space treaties such as: Rescue Agreement; Liability Convention; and Registration Convention.
2. **The Principles as Formulated in Existing International Law**
In Article 3 of the Space Treaty of 1967 it is clearly stated that International Law, including Charter of the United Nations shall apply to space activities. It implies that other sources of international law, mainly international treaties, shall also apply to space activities. Some relevant instrument under the framework of international law shall apply, including but limited to: the ITU Constitution and Convention and its Amendments, including Administrative Regulations; the Treaty Banning Nuclear Weapons Test on the Surface of the Earth, in the Atmosphere or in Outer Space of 1963; the Treaty on the Non-Proliferation

of Nuclear Weapon of 1968. The arrangement among the group of several developed countries regarding “Missile Technology Control Regime”.

3. The Principles in the Form of Soft Law

In addition to the above-mentioned space treaties and other international treaties relevant to space activities, some other UNGA Resolutions containing principles governing certain space activities must be taken into consideration when formulating national space legislation. These include, among others, Resolutions pertaining to Legal Principles Governing Direct Television Broadcasting; Principles on Remote Sensing from Outer Space; and Principles on Nuclear Power Sources in Outer Space. In addition to these Resolutions, states must also consider the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit of all Countries, especially those of Developing Countries.

4. The Principles as Found in the Form of State Practices

The principles in the form of international common practices and best practices, particularly in the form of national space acts of other countries shall be taken into consideration in the process of formulating national space legislation. The previous activity in the process of preparing the draft of national space legislation, including some comparative analysis to the national space legislation of other countries, such as: the USA; Russia; the United Kingdom; France; Sweden; the Netherland; the People Republic of China; Australia etc.²⁹⁹. Such comparative analysis is important to draw some common elements of national space legislation that need to be taken into consideration.

²⁹⁹ For further reading on comparative analysis on national space legislations of different countries, see I.B.R. Supancana, *Peranan Hukum dalam Pembangunan Kedirgantaraan (The Role of Law in Aerospace Development)*, Mitra Karya Publisher, Jakarta, 2003, at page 19-32.

B. The Transformation Process

1. Ratification

So far Indonesia has ratified four (4) of five (5) Space Treaties. Existing Space Treaties that have been ratified are: Space Treaty of 1967³⁰⁰; Rescue Agreement of 1968³⁰¹; Liability Convention³⁰²; and Registration Convention³⁰³; the being the Moon Agreement of 1979. By ratifying the aforementioned Space Treaties, Indonesia has transformed the provisions of those treaties from international legal norms into a part of national law. Consequently, the formulation of national space legislation took into consideration and subjects itself to existing international space law.

2. Adoption of the Principles from Soft Law

Another form of transformation was conducted by way of adopting the principles as laid down under several soft laws, in this case UNGA Resolutions governing certain activities in outer space. These include Resolutions pertaining to: Legal Principles Governing Direct Television Broadcasting³⁰⁴; Principles on Remote Sensing from Outer Space³⁰⁵; and Principles on Nuclear Power Sources in Outer Space³⁰⁶. In addition to these Resolutions, States must also consider the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit of All Countries, especially those of Developing Countries³⁰⁷.

3. Taking into Account some Common Elements from International Practices

³⁰⁰ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space of 1967 was ratified by Law No. 16 of 2002.

³⁰¹ Agreement on Rescue of Astronaut and the Return of Objects Launched into Outer Space of 1968 was ratified by Presidential Decree No. 4 of 1999.

³⁰² Convention on International Liability for Damages caused by Space Object of 1972 was ratified by Presidential Decree No. 20 of 1996.

³⁰³ Convention on Registration of Objects Launched into Outer Space of 1975 was ratified by Presidential Decree No. 5 of 1997.

³⁰⁴ UNGA Resolution No. 37/92 of 1982.

³⁰⁵ UNGA Resolution No. 41/65 of 1986.

³⁰⁶ UNGA Resolution No. 47/68 of 1992.

³⁰⁷ UNGA Resolution No. 51/122 of 1996.

New developments in international space law emerge from practices both in the form of national space legislation promulgated by different countries and from a number of commercial practices within the business community. Although different countries have different approaches in developing their national space legislation, some common elements can be found in the provisions of their regulations.

C. **Common Features of International Standards of National Space Legislation**

Based on some researches, national space legislation that fulfill international standards consist of the following provisions/principles: the use of international treaties and existing national space legislation as a basis and guidelines; the need to balance international obligations and national interest; the promotion of international cooperation; the need to maintain flexibility and constant evolvement; and the gradualness of the process, with ordering of priorities³⁰⁸. Another is of the opinion that a comprehensive national space legislation need to cover the following issues: international legal responsibility for national activities; governmental and private liability; governmental safety requirements for commercial space vehicles; the economic stability of the launch business; compliance with environmental laws; national security considerations; the protection of space investments; the promotion of national space commerce; the definition of the boundaries of outer space in order to ascertain the scope of national space legislation; and the continues oversight of commercial space activities after launch³⁰⁹.

³⁰⁸ For further analysis, see Zao Yun, National Space Legislation, with reference to China's Practice, paper presented at Space Law Conference, Bangkok, August, 2006.

³⁰⁹ See Paul B Larsen, Is National Legislation on Commercial Space Needed? comments on the paper of Zao Yun at Space Law Conference, Bangkok, August, 2006.

III. HARMONIZING INTERNATIONAL PRINCIPLES AND NATIONAL INTEREST IN FORMULATING NATIONAL SPACE LEGISLATION: INDONESIA EXPERIENCE

A. National Interest

1. Outer Space Vision

The first vision regarding outer space activities can be witnessed from Soekarno, the founding father of the Republic of Indonesia. In 1963, only 5 years after NASA was established in USA³¹⁰, the similar institution, namely the National Aeronautics and Space Institute (LAPAN) was established in Indonesia. Another organization in charge of policy making namely National Council on Aviation and Space (Depanri) was established in the same year³¹¹. Soeharto, as the second President of the Republic of Indonesia, in 1976 a more than one decade afterwards initiated the launch of Palapa Satellite Series, which became the first Satellite used by a developing country as its domestic satellite communication system. The vision of the past two influential leaders shall be maintained and used as guidelines to determine national interest in outer space³¹².

2. Specific Geographical Situation

One of the reasons why application of space science and technology for Indonesia is very important is its specific geographical situation. Indonesia is an archipelagic country with more than 17.000 islands and more than 240 million people and more than 200 local languages which pose special challenges in preserving its unity. To overcome such challenges and being a disaster-prone country, Indonesia is dependent to mastering

³¹⁰ NASA was established based on NASA Act of 1958.

³¹¹ DEPANRI was established by Presidential Decree No. 24 of 1963. DEPANRI is the highest coordinating body in formulating aerospace policy in Indonesia. The main duty of DEPANRI is to assist the President in formulating general policy in the field of aviation and space.

³¹² I.B.R Supancana, "Mewujudkan Undang-Undang Keantariksaan Visioner yang Bertumpu pada Kepentingan Nasional dan Berstandar Internasional", Paper presented at Public Hearing before the Commission VII of the Indonesian Parliament in deliberating National Space Act, 3 October, 2012.

and applying space science and technology. Thus, the specific geographical situation of Indonesia becomes a determining factor in formulating national interest in space.

3. **Prosperity and Security Interest**

Basically, national interest can be viewed both from security and prosperity approaches. From the prosperity approach, outer space activities shall be dedicated to promote national prosperity, ranging from telecommunication, remote sensing, research and observation of the atmosphere and ionosphere, weather forecasting, disaster management, global positioning system, etc.³¹³. From the security approach, outer space shall be exclusively used for peaceful purpose to maintain international peace and security and to protect national sovereignty and territorial integrity.

4. **Access to Outer Space**

As a developing country, it is Indonesian National interest to secure access to outer space. Access to outer space cover: access to the taking of benefits from natural resources in outer space; access to the benefits from the application of space science and technology; access to space science and technology; and access to international market³¹⁴.

B. **International Obligations**

In the formulating of national space legislation, it is very important to balance between national interest and international obligations. So far, Indonesia have ratified four (4) of five (5) space treaties, such as: Space Treaty of 1967; Rescue Agreement of 1968; Liability Convention of 1972; and Registration Convention of 1975. In addition, Indonesia is very active in formulating some relevant UNGA resolutions relevant to outer space activities such as: UNGA resolution on remote sensing;

³¹³ See, I B R Supancana, Indonesia's Space Policy and Institutions, Paper presented at the UN/Korea Workshop on Space Law, Daejeon, Republic of Korea, 3-6 November 2003.

³¹⁴ For further analysis on access to outer space, see I.B.R. Supancana, Guaranteeing Access of Developing Countries to Outer Space, Discussion Paper presented at IISL Space Law Conference, Beijing, April 2004.

direct television broadcasting; nuclear power sources in outer space; international cooperation.

By ratifying the above-mentioned space treaties, Indonesia is obliged to comply with its provisions, including in formulating its national space legislation. Indonesia is also morally obliged to comply with relevant principles of UNGA resolutions as it reflecting the international legal consciousness and practices among countries.

C. The Formulation Process of National Space Legislation

1. Academic Draft

The first Academic Draft of National Space Act was finalized in 2003. Under national laws and regulations of the Republic of Indonesia, an academic draft is required for as a scientific justification in formulating a law, both from philosophical, sociological, as well as juridical perspectives. It contains some issues, such as: background; purpose and objectives; identification of problems; theoretical study and empirical practices; evaluation, harmonization and synchronization with existing laws and regulations, including with relevant international legal instruments; scope of coverage; issues to be regulated; etc.

The first draft was then followed by public consultation meeting where relevant stakeholders were invited. As far as possible, aspiration and interest of all relevant parties were considered and accommodated in order to maximize the benefits while minimize its negative impacts.

In the process of preparing an academic draft, comparative analysis to national space act of different countries are important as it provide some common elements of national space acts reflecting a kind of standard of national space legislation. Such comparative analysis is also important to consider different models of national space legislation, from general and comprehensive model to specific models.

By conducting comparative analysis, a tailor-made Indonesian national space legislation which fit to the needs and

interest of Indonesia with its specific geographical situation can be formulated without violating any international obligations.

2. **Draft of National Space Act**

The first draft of National Space Act was launched in the same year (in 2003). The provisions of the draft were formulated based on the first Academic Draft. Some expert in legal drafting contributes to the quick finalization of the first draft.

For the purpose of improving the quality of the draft and in order to get some input from different governmental institutions, an interdepartmental working group was established coordinated by the Indonesian Aeronautics and Space Institute (LAPAN). In the process of improving the draft, the first draft was reviewed and revised quite frequently. At the later stage, the harmonization process was conducted under the coordination of the Ministry of Law and Human Rights, followed by obtaining the approval from relevant Ministries for its submissions to the President of the Republic of Indonesia. Then, the President submits the draft and its elucidation (including its Academic Draft) to the Parliament.

The final draft of National Space Legislation consist of XVII Chapters and 99 Articles and its elucidation with the following main provisions: general provisions; space activities and its supervisory system; space management system; space research; mastering of technology; launching of space object; application of space technology; space activities for defense and security; international cooperation; safety and security; registration system; licensing system; responsibility and liability; insurance; protection of intellectual property rights; environmental protection and preservation; financing and incentives; community participation; dispute settlement mechanism; criminal investigation; sanction; transitional provisions; and concluding provisions.

The main provisions of the Draft National Space Act have incorporated common elements from the provisions of national space legislation as identified by Working Group on National

Legislation relevant to the Peaceful Uses of Outer Space, namely: scope of application; authorization and licensing; continuing supervision of activities of non-governmental entities; registration; liability and insurance; safety; and transfer of ownership or control of space object in orbit³¹⁵.

Some important provisions reflecting the incorporation of standards of International Space Law in the final Draft of National Space Act can be described as follows:

- a. Article 3 paragraphs (1) and (2) of the Draft states that Outer Space shall be the province of mankind and exploration and use of outer space shall be for the benefit and in the interest of mankind irrespective of level of economy or science and technology. Outer space shall be free for the exploration and use by all states without discrimination of any kind on the basis of equality and in accordance with international law.
- b. Article 4 (1) and (2) of the Draft state that any space object launch for and/or on behalf of the Unitary State of the Republic of Indonesia shall be subject to jurisdiction and control of the government of Indonesia. Any person at space object and facilities owned by Republic of Indonesia shall be subject to laws and regulations of the Republic of Indonesia.
- c. Article 14 of the Draft states that any space activities is forbidden to: placing, orbiting, or operating nuclear weapons or other weapons of mass destruction; testing of nuclear weapon or weapons of mass destruction in outer space; using Moon and other celestial bodies for military purposes or other purposes which may be dangerous to mankind; conducting activities which may harm the safety and security of space activities, including space object; conducting activities harmful to pollution and/or causing

³¹⁵ See UNGA Doc no A/AC.105/C.2/2010/LEG/L.1 Draft Report of the Chair of the Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space, dated 31 March 2010.

environmental damages, including the damages to space object.

- d. Article 68 (1) states that the Government shall be responsible to conduct search and rescue in case of emergency landing and accident to astronaut in the territory of the Republic of Indonesia.
- e. Article 69 (1) states that any space object launched from the territory of the Republic of Indonesia or launched beyond the territory of the Republic of Indonesia by either by Indonesian governmental agencies, legal entity or Indonesian citizen shall be registered by the National Space Agency.
- f. Article 72 (1) states that the Government of the Republic of Indonesia shall be active in membership of international organizations relevant to space activities in promoting international cooperation.
- g. Article 74 of the Draft states that the Government of the Republic of Indonesia shall be internationally responsible for any space activities conducted in and/or from the jurisdiction of the Republic of Indonesia.

3. **Formulation Process of Law No. 21 of 2013 concerning Space Activities at the Parliament**

The formulation process of the Indonesian National Space Act was quite intensive, progressive and fruitful as reflected in the following process:

- a. The initial meeting between the executive and the parliament
- b. The inventory of issues

The total number of issues to be discussed with the parliament were 571 issues, 366 of it were not changed while 137 issues were discussed by the corking committee, 10 issues discussed by the formulating team and 101 issues discussed by the synchronization team.

- c. The discussion of the inventory of issues within the working committee
137 out of 571 issues were discussed by the working committee. The issues discussed by the working committee were the substantial issues where all faction represented in the Commission VII delivered their comments and suggestions for the improvement of the drafts.
- d. The insertion of two new issues
During the discussion at the working committee, the writer as the government 's legal expert proposes to add two (2) new issues to be incorporated in the draft National Space Act, namely the issue of provisions concerning Commercialization of Space Activities and the issue of Export Control.
The inclusion of provisions concerning commercialization of space activities is considered important as in practice commercial space activities have become reality both in international as well as national level. Meanwhile the inclusion of provisions regarding Export Control is required to facilitate and anticipate the implementation of space cooperation between Indonesia and other countries, such as Air Launch Space Transportation project with Russia. Under the Technology Safeguard Agreement between the two countries, Indonesia is required to have a national regulation concerning export control on space and sensitive technology.
- e. The discussion of the inventory within the formulation team
10 issues was discussed by the formulating team, mostly on language issues in the formulation of the draft.
- f. The discussion of the inventory within the synchronization team. The synchronization team discussed 101 issues, most of its issues on the whole systematic and format of the Draft based on previous discussions in the working committee as well in the formulating team.

- g. The deliberation at the plenary session on July 9th, at the plenary of the Parliament, the Draft National Space Act was endorsed by the parliament and submitted to the President for further enactment.
 - h. The enactment by the President. By Law No. 21 of 2013, the Law concerning Space Activities was enacted.
4. The Main Provisions of Law No. 21 of 2013 concerning Space Activities
- The Law No. 21 of 2013 consists of XIX Chapters and 105 articles, including its Elucidation. The main provisions are: general provision; space activities; the governance of space activities; supervisory system; space port; safety and security; search and recovery; state responsibility and international liability; registration system; international cooperation; environmental protection; insurance; financing; community participation; administrative and civil penalty; criminal provisions; other provisions, etc.

IV. CONCLUDING REMARKS

To conclude my presentation on how progressive development of International law affects the process of national space legislation, in this case in formulating Indonesian Space Legislation and the lesson learned from its processes, some conclusions can be drawn:

- A. In the formulating of national space legislation, Indonesia has taken into consideration standards of international (the progressive development) of outer space law by adopting its laws and principles as promulgated both under the space treaties (hard law) as well as UNGA Resolutions (soft law) and new developments based on commonly recognized best practices.
- B. In formulating its national space legislation, Indonesia has taken a balanced approach between national interest and its international obligations.

- C. By incorporating the standards of international space law into its national space legislation, it will make an important contribution to facilitating international relations and cooperation in the further development of space science and technology, and in its application to fulfill the needs of national development.

THE LEGAL CHALLENGES OF IMPLEMENTING NATIONAL SPACE LEGISLATION: THE CASE OF INDONESIA^{*}

I. INTRODUCTION

A. The Long Process of Formulating National Space Legislations

1. Geographic and Demographic Situation of Indonesia

Indonesia is the largest archipelagic country in the world with more than 17.504 islands. The total territorial jurisdictions of about 8 million square kilometres, 2/3 of which are waters. The distance from the Western Part of the Indonesia (Sabang) to the Eastern Part of Indonesia (Merauke) are around 5.000 kilometre. Indonesia is also possessing the second longest coastline in the world of about 80.000 kilometres. Another important geographical situation is that being situated in a ring of fire (volcanic) Indonesia is also a disaster-prone country³¹⁶.

From the demographic perspectives, the population of Indonesia is more than 240 million people and consisting of

^{*} German Journal of Air and Space Law, Vol. 65 No 2 Year 2016

³¹⁶ See I.B.R. Supancana, "Indonesian Space Legislation, Vision, Formulation and Challenges for its Implementation", Lecture at Advance Studies on Air and Space Law, Leiden University, February 24, 2016. Page 1.

different races spreading across the country and using around 749 different languages.

The specific geographical and demographical situation of Indonesia requires and dependent to the application of space science and technology to accommodate national interests, both security as well as prosperity approaches. Such dependency creates urgency to have a national space legislation in order to secure sustainability in conducting and fulfilling certain activities, such as: telecommunication, remote sensing, direct (television and radio) broadcasting, weather forecasting, disaster mitigations and management, information and communication technology, resource management, city planning, defence and security, education and training as well as poverty alleviation³¹⁷.

The need to develop national space legislation will be used as instrument for the implementation of space policy, instrument to accommodate national interests, a tool of social engineering and promote space utilization to support national development, protect public interests and promote international cooperation.

2. Developed through the Great Aerospace Vision of the Founding Fathers

Recognizing the specific geographical and demographical situation of Indonesia and the need to secure sustainable application and mastering of space science and technology, since the very beginning (the establishment of the Republic of Indonesia) the Founding Fathers of the Republic of Indonesia have charted its space vision, both through establishment of relevant institutions and legal framework. The great visions were further elaborated into Missions and Policies.

3. Initial initiatives and Studies

Some initial steps were taken as preliminary preparations including: setting-up interdepartmental working groups to

³¹⁷ See I.B.R. Supancana, *Space Law Development in Retro and Prospect*, Mitra Karya Publisher, Jakarta, 2006, page 141.

examine the viability of formulating national aerospace law, which further focused on preparing national space legislation.

Parallely, studies were conducted on the urgency and feasibility to ratify relevant space treaties in order to make sure that the proposed national legislation will be in conformity and in accordance with the international standard of national space legislations. As the results, 4 among 5 space treaties were ratified, and the principles of which were incorporated into the draft of national space legislations³¹⁸.

As a part of preparing national space legislation, some preliminary researches have been conducted, which include but not limited to: study on the interpretation and implementation of international space treaties as considerations for developing national space legislation; conducting comparative study on national space legislations in several countries in order to decide the best model of national space legislations which fit to the condition of Indonesia;³¹⁹ study on the possibility to adopt some principles as formulated in existing soft laws concerning space activities; study on some important concepts and regulations for conducting space activities, such as on liability issues, national licensing, registration system, definition/delimitation of outer space, environmental issues, commercial utilization of outer space; institutional issues; some other instruments which reflects common elements of national space legislations were also considered for possible incorporation in national space legislation³²⁰; etc.

³¹⁸ Outer Space Treaty of 1967 was ratified by Law No 16 of 2002; Rescue Agreement was ratified by Presidential Decree No 4 of 1999; Liability Convention of 1972 was ratified by Presidential Decree No 20 of 1996; while Registration Convention was ratified by Presidential Decree No 5 of 1997.

³¹⁹ Some national space legislations from different countries were, among others: USA, UK, Australia, South Africa, Sweden and French.

³²⁰ See UNGA Doc No A/AC/Ac.105/C.2/101. Report of the Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space, 3 April 2012. This at the later stage was adopted in the UNGA Resolution 68/74 of 16 December 2013 on Recommendation on National Legislation relevant to the Peaceful Exploration and Use of Outer Space.

4. **Deliberation and Enactment Process**

In total, from the first academic draft and draft law which was prepared in 2003, it took around 10 years to deliberate and enact the national space legislations. The first draft consists of 16 chapters and 51 articles, while the final draft which was submitted to the parliament consists of 21 chapters and 105 articles and explanatory notes.

The deliberation process in parliament were started by initial meeting between the Executives (the Government) and the Legislative (the Parliament). The Inventory of issues were totally 571 issues, where 366 of which were not changed and no need to be discussed, while 137 issues were discussed in the working committee (Panitya Kerja/Panja), 10 issues were discussed in the Formulating Team (Tim Perumus) and 101 issues were discussed by synchronization team (Tim Sinkronisasi). Prior to the deliberation process, public hearings were conducted by inviting experts of relevant fields and during the deliberation process also involve legal and language experts.

Two new issues were discussed and inserted, namely the issues of commercialization and export control. And finally on 9 July 2013 the draft law was endorsed by the Parliament in its Plenary Session to be signed by the President within 30 days after endorsement and was enacted in the form of Law No 21 of 2013 concerning Space Activities.

A. **The Scopes**

The scope of provisions in the Law No 21 of 2013 concerning Space Activities were quite comprehensive, which consists of XXV Chapters, 105 articles and its elucidations. Some key provisions are, among others: general provisions; scope of space activities; management and supervision for space activities; space port; safety and security, search and recovery; registration; international cooperation; responsibility and liability; insurance, security and facility; environmental protection and preservation; funding; public participation; civil and

administrative sanctions; criminal provisions; provisional provisions and final provisions.

C. The Characteristics

In general, the characteristics of Law No 21 of 2013 are: visionary, outward looking, balancing national interests and international obligations, taking into account international standards and practices and comprehensive.

II. THE MANDATE FOR THE IMPLEMENTATION

The mandate for elaboration into operational regulations for the implementation of Law No 21 of 2013 concerning Space Activities can be found spread out in some articles and cover variable of issues:

A. Formulation of Annual Space Policy

It is mandated that in order to up-date the status and progress of the Outer Space Activities and provide for its policy development, the Agency shall conduct space policy studies³²¹.

B. Remote Sensing Activities

On Remote Sensing activities, covering both data acquisition, data processing, data storage, and data utilization and information dissemination, the further provisions of conducting Remote Sensing Activities shall be regulated by Government Regulation³²².

C. Mastery of Space Science and Technology

Being an archipelagic and disaster-prone country, which is dependent on space science and technology and its application, mastery of space of space science and technology become a must. Mastery of space science and technology shall include: rocket technology, satellite technology; aeronautics technology, and spin-off technology. This can be done among other by transfer of technology. To achieve such objectives, the

³²¹ See Law No 21 of 2013 concerning Space Activities, Article 9.

³²² Ibid, article 23.

procedures and mechanism for its implementation shall be regulated in accordance with laws and regulations³²³.

D. Sensitive Technology

It is recognized that any efforts to achieve mastery of outer space technology will deal with security aspects of sensitive technology, it is therefore important to ensure the security which is intended for peaceful, national interests and compliance with the international obligations. For that purpose, the procedures and mechanism of the security of sensitive technology shall further be regulated by Government Regulation³²⁴.

E. Procedure of Space Launching

The launching activities can be conducted, both from the territorial sovereignty, jurisdiction, as well as a vessel or aircraft of Indonesia, or even from a foreign vessel or aircraft within the territory or jurisdiction of Indonesia. There is also the possibility from foreign territory as long as the vehicle belongs to the Republic of Indonesia.

Further regulation concerning the procedure of launching and to fulfil certain requirements as imposed by the Law No 21 of 2013, shall be regulated by the National Space Agency³²⁵.

F. Commercialization of Space Activities

In line with the progress in space science and technology and its application, commercialization of space activities will become inevitable. Commercialization of space activities may cover: telecommunication, direct broadcasting, remote sensing, space tourism, space mining, space financing, space settlement, etc.

One of the objectives of formulating national space legislation is to ensure that all space activities, including commercialization of space activities can be conducted in an orderly manner and

³²³ Ibid, article 26 para (3).

³²⁴ See, Ibid, article 27 para (3).

³²⁵ See, Ibid, article 36.

shall benefit mankind. Although under Law No 21 of 2013 only one article deals with provisions on commercialization of space activities, but these provisions will be further regulated in the form of Government Regulation³²⁶.

G. **The Structure of National Space Agency**

One of the important provisions in the Law No 21 of 2013 concerning Space Activities is to enlarge and empower the existing national space agency so called LAPAN. The consequences of such provision are that there is a need to elaborate the main task and functions of LAPAN into a new structure, the structure of which shall be regulated in the form of a Presidential Regulation³²⁷.

H. **Space Port**

Being an equatorial country, Indonesia enjoys the benefit to become an ideal location as space port. Considering such advantages, some countries have offered the possibility to cooperate to build and operate space port within the territory of the Republic of Indonesia. The proposed space port can be conventional one as well as for non-conventional one such as the use of air field as intermediate air launch for space transportation system and even in the form of mobile space port for sea launch.

The space port theoretically can be built by the government as well as by other non-state actors provided that it acquires relevant licenses and approvals from the government. As the activities at the space port and its surrounding pose some possible dangers, it is required to be elaborated into Government Regulation. Such Government Regulation would cover provisions on the procedures on the construction and operation of a space port³²⁸.

I. **Procedure of Accident Investigation**

As extra hazardous and ultra-hazardous activities, space activities are prone to a possible accident. The impact of space accident

³²⁶ Ibid, article 37 para (2).

³²⁷ Ibid, article 38 para (4).

³²⁸ See *ibid*, article 50.

may be catastrophic. The space accident can be in the form of re-entry of space object as well as collisions among space objects, both active and inactive ones. After an accident there is a need to conduct accident investigation in order to know the cause of accident and /or to identify the potential danger it may cause. The member of the accident investigation team shall comprise experts in many relevant fields³²⁹. Considering the complexity of aspects in conducting space accident investigations, the provisions of the Law No 21 of 2013 stated that further provisions regarding the procedures of conducting accident investigations of space vehicles shall be regulated by the Agency Regulation³³⁰.

J. **Launching Licenses**

As stated in the provision of article 69 of Law No 21 of 2013 concerning Space Activities, immediately after an accident occurred, the launching license and other related to launching activities shall be suspended. The provisions regarding the criteria and requirements for suspension, freezing, revocation and alteration of launching licenses shall be regulated by Government Regulation³³¹.

K. **Liability and Compensation**

In any activity, including space activities, accident may happen and consequently any damages caused by space activities shall be subject to liability and compensation. The provisions on liability and compensation under Law No 21 of 2013 concerning Space Activities cover broad aspects, it covers not only the Government's Liability both to foreign as well as Indonesian victims or property. It also regulates the basis of liability, recoverable damages, procedure for claim for compensation, transfer of ownership and its impact toward liability, joint and severally liability, and liability

³²⁹ Member of technical expert team who conduct space accident investigation at least consist of expert in the following fields: outer space technology, aeronautic technology, foreign relations, nuclear power, aerospace power. See Ibid, article 60.

³³⁰ Ibid, article 68.

³³¹ Ibid, article 69 para (5).

for private space activities. As liability and compensation issues are complex issues, further detail regulation is needed and will be regulated in the form of a Government Regulation³³².

L. Insurance

Being a risk-prone activity, in conducting any space activity there is a need to cover possible risks and also to allocate risks by way of insuring its risk. Law No 21 of 2013 obliges a space operator to insure its risk, particularly third-party liability risks. The provision of risk insurance will further be regulated by a Government Regulation³³³.

M. Community Participation

In any laws, it is common to regulate the provisions concerning Community Participation. This is a logical consequence of democracy. Law No 21 of 2013 opens equal and broad opportunity for community participation. The main objective of such provision is for enhancement and optimization of benefits in conducting and managing space activities. The forms of Community Participation can be in the form of: monitor and maintain, provide input and improving regulation, submit opinion and considerations, give priority and promote space activity, up to submitting class actions.

It is mandated under this Law that further provisions concerning community participation shall be regulation in the form of a Government Regulation³³⁴.

N. Administrative Sanctions

In case that the fault by space operator causes damages, it shall be liable to pay for compensation. Any person, under this Law who violates certain provisions under this Law shall be subject to administrative sanctions³³⁵. Administrative sanctions can be in the

³³² Ibid, article 83.

³³³ Ibid, article 84 para (3).

³³⁴ Ibid, article 92.

³³⁵ In case of violating provisions of Law no 21 of 2013, in particular article 21, article 35, article 45 para

form of: written warning, temporary suspension of either a part or the whole activities, administrative fine, revocation of license, dissolution of the corporation or legal entity, etc. It is mandated that further provisions regarding procedures of the imposition of administrative sanctions and the amount of administrative fine shall be regulated by Government Regulation³³⁶.

For the implementation of the above mandates, further regulations in the form of a Government Regulation and a Presidential Decree shall be enacted within no longer than two years, while the Regulation of the Agency as mandated by this Law shall be enacted no longer than one year from the date of enactment of this Law³³⁷. The facts have shown that almost three years after the enactment of Law No 21 of 2013 concerning Space Activities, none of implementing legislation has been enacted. Only a draft Government Regulation concerning Remote Sensing has been finalized. It indicates that it is not easy to implement the Law.

III. THE LEGAL CHALLENGES

A. Promoting Compliance through Socialization

The main challenges for an effective implementation of any law and regulation is how to make sure that once they are enacted the level of compliance will be high, both to governmental agencies, business actors, as well as public at large. Such challenges also apply to Law No 21 of 2013 concerning Space Activities.

In order to promote compliance, a socialization process has been conducted in order to get more understanding from all stakeholders³³⁸ on the content and implication of provisions as contained Law No 21 of 2013 to their interests, rights and obligations.

(2), article 48, article 49, article 51 para (2), article 56, article 65.

³³⁶ Ibid, article 94 para (3).

³³⁷ Ibid, article 104.

³³⁸ Relevant stakeholders are; universities, research institutions, relevant governmental institutions, industries, satellite operators, interest groups, state-owned companies, and public at large.

B. Effective Implementation through Adequate Preparation

One of the key factors that contributes to the effectiveness of laws and regulations is the adequate preparation. Adequate preparation shall cover, both organization, human resource, and funding.

In terms of organization, the Law No 21 of 2013 provides broader power and competences to LAPAN (Indonesian Aeronautics and Space Institute) in coordinating space-related activities. To implement such mandate, there is a need for a Presidential Decree concerning the new organizational structure of LAPAN.

On human resource development, there is a need to have a comprehensive roadmap for capacity building in order to develop genuine capabilities in mastering space science and technology and its applications. The capacity building program can be conducted through international cooperation based on the principles of voluntary, equality and mutual benefits.

On funding issues, the main problem is the limited fund that so far been allocated in the State budget to fund space activities, both for scientific research as well as for its application. For space activities dedicated to public interests (disaster mitigation, weather forecasting, etc.) which are conducted by governmental agencies, more fund allocation is required. Meanwhile for private and commercial activities, the funding can be acquired from private sectors and financial institutions. For procurement of commercial satellites, for example, funding can also be acquired from foreign creditors. In order to accommodate legal issues which may arise from participation of foreign financial institutions, there is a need to reform some relevant regulations, particularly national law on Guarantee (which covers fiducia, hypothec, etc.). As a way to reform such national law, it is also important to consider the possibility to ratify the Convention on International Interests in Mobile Equipment and Protocol of Space Asset.

C. Improving Coordination Mechanism Among Relevant Institutions

Coordination is something that is easy to say, but not easy in its implementation. Such situation emerges due to the fact that the key

performance indicators of governmental agencies are quite sectoral. The ego-sectoral approaches create more difficulties in conducting coordination. Some governmental institutions, based on their interpretation on some relevant laws and regulations related to their main task and function tend to secure the implementation of their sectoral interests and are seldom willing to sacrifice the sectoral interests, even in the case they have to face a broader interest, which is a national interest.

As coordination is a very essential issue in space activities that may involve different institutions, coordination mechanism should be developed in all stages and kinds of space activities by emphasizing on accommodating national interests rather than a sectoral approach. For that purpose, cross-sectoral approach must be exercised. In addition, there must be clear legal basis for conducting coordination activities with its coordination procedures, including sanctions.

D. Elaboration of Rules concerning Management and Supervision of Space Activities (Licensing, Registration and Liability Issues)

As mandated by Law No 21 of 2013 concerning Space Activities. Rules concerning Management and supervision of Space Activities must be elaborated, which would cover some important issues, such as licensing, registration, state responsibility and liability.

1. Licensing

In a way to guarantee that space activities can be conducted in a safe and orderly manner, licensing issue is the key instrument. Through licensing, both national security as well as public interest can be protected. Thus, the objectives of further regulation on licensing system are: to secure safety and security; for the distribution of liability and to manage limited natural resources.

The elements of licensing cover: general space licenses; launch permit; overseas launch certificate; and authorized return of an overseas launch object. There are also some basic requirements for space licenses where it should comply with international obligation of the State; while accommodating

national interests, national security and foreign policy; protect safety and public property and cover premium insurance for any possible damages.

There are some required data and information that should be met to acquire space licenses, which include but not limited to: launching facilities, organization of launching facilities, types of launching vehicle, environmental plan, project management plan, flight test plan, emergency plan, technology security plan, and outstanding equity plan.

Some standard requirements for a launching permit are applied to guarantee that: not to cause damage; not to involve the use of nuclear weapon or weapons of mass destruction; not to involve the use of dangerous materials and fulfilling financial and insurance requirements.

A further aspect of rules concerning a launching permit is to prepare a launching permit application form that contains the following characteristics: in written; possess space licenses; date and time for launch; payload, manufacturer and mission; orbital payload and sensor and information gathering equipment; information registration based on the Registration Convention; re-entry location (if any); and required information, including the flight safety code.

2. **Registration**

Having an implementing regulation concerning registration is inevitable in conducting space activities as the main objective of a registration system which is directly related to the exercise of jurisdiction and control. It is also related to the issue of ownership, liability and the utilization of orbit-spectrum resources.

In conducting space activities, as far as registration issues are concerned, there are different types of registration: registration for the launching; registration for the use of orbit-spectrum resources; and registration for ownership.

As contracting State to the Registration Convention³³⁹, the registration for the launching of space activities must be in accordance with the Registration Convention. There are some basic provisions under the Registration Convention that should be observed, among others:

- The obligation of the launching state to register an object launched into outer space in an appropriate registry which it shall maintain and shall inform the Secretary General of the United Nations of the establishment of such a registry³⁴⁰.
- In a joint launching, the parties shall jointly determine which one of them shall register the object³⁴¹.
- The information to be furnished by the state of registry shall include: name of launching state; appropriate designator of the space object or its registration number; date and territory or location of launch; basic orbital parameter, including nodal period, apogee and perigee; general functions of the space object; periodical information concerning the object; and information regarding inactive satellite³⁴².

Under the Law No 21 of 2013, the obligation to register the object launched into outer space is coordinated by LAPAN (Indonesian Aeronautics and Space Institute), while the registration concerning the utilization of orbit-spectrum resources is coordinated by the Ministry of Communication and Information. In addition, the registration concerning the ownership of space objects is being considered as Indonesia is still exploring the possibility to ratify the Convention on International Interests of Mobile Equipment and its Protocol of Space Asset. There is the possibility that the Minister of Law and

³³⁹ Convention on Registrations of Objects Launched into Outer Space of 1975 or known as Registration Convention (adopted 1974, entered into force 15 September 1976). 1023 UNTS 15.

³⁴⁰ Registration Convention, article II paragraph 1.

³⁴¹ Ibid, article II paragraph 2.

³⁴² Ibid, article III.

Human Rights will be the one to be in charge to coordinate the registration of ownership.

3. **State Responsibility and Liability**

The issue of State Responsibility and Liability (both international and national) is a very important issue concerning space activities, both conducted by state institutions as well as private sectors or even in cooperation with foreign state institutions and foreign private sectors.

In the efforts to elaborate further provisions on State Responsibility and Liability for any space activities conducted under Indonesian Jurisdiction, it is first of all important to have a clear understanding on the concept of responsibility and liability. Legally a distinction should be made between responsibility and liability. Responsibility is a legal obligation that should be exercised by one party vis-à-vis another. Etymological analyses show that responsibility is derived from the Latin “responderere”, which means to answer to another for something or to an engagement, and from the French, “répondre”, which has a similar connotation³⁴³.

Under the existing space law, the basic principles concerning state responsibility in the provision of the article VI of the Space Treaty³⁴⁴ where state parties shall bear international responsibility for national activities³⁴⁵ in outer space, including the Moon and

³⁴³ See, Nathalie L.J.T Horbach, *Liability Vs Responsibility under International Law*, Dissertation, Leiden, 1996, page 21. See also, Bin Cheng, *Studies in International Space Law*, Clarendon Press, Oxford, 1997, page 603. As cited by I B R Supancana, *The International Regulatory Regime Governing the Utilization of Earth Orbits*, Dissertation, Leiden, 1998, page 145-146.

³⁴⁴ Treaty on Principles Governing the activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies of 1967 or called Outer Space Treaty, 27 January 1967, 610 UNTS 205, 18 UST 2410.

³⁴⁵ National activities by Prof Wassenbergh was defined as:

- Any activities carried out from the territory of a State, but then only” as far as the effect of that activity in outer space, or by it, from outer space on the Earth or in air space is concerned; and
- Any activity in outer space of any space craft, registered by the State in its name (the State thereby establishing its jurisdiction and control and thus its international responsibility), or as far as launch and space transportation is concerned;
- Any activity of a space carrier, incorporated under the laws of the State and having its main operational basis in the State, for the purpose of the technical/operational as well as the economic regulation thereof.

For further detail, read Wassenbergh, “The Law Governing International Private Commercial

other celestial bodies. There are a set of international obligations under the existing space law, particularly in the Outer Space Treaty³⁴⁶, the violations of which shall entail international responsibility. Some other provisions can be found in the forms of soft laws.³⁴⁷

On liability issues, it is important to formulate an integrated and comprehensive system of liability, which cover not only international liability, but also domestic liability. As contracting party to the Liability Convention³⁴⁸, the system for international liability in the framework of the Liability Convention has been incorporated into Law No 21 of 2013, while additional provisions regulating domestic liability issues cover liability issues when the victims are Indonesian or nationals of other countries involved in joint mission with Indonesia. It should contain procedures for claim for compensation, and the basis of liability which is following the same basis of liability as applied to international liability. Some other liability issues that should be regulated include scope damages and defining recoverable damages.

E. **Elaboration of Rules concerning Certain Sectors of Activities**

Further elaboration of rules concerning certain activities are mandated by Law No 21 of 2013 on Space Activities, particularly on Remote Sensing and Space Port.

1. **Remote Sensing**

On Remote Sensing activities from outer space, a draft Government Regulation has been finalized which contains the following provisions: general provisions; management of

Activities of Space Transportation”, *Journal of Space Law*, Vol. 21, no 2, 1993, page 108.

³⁴⁶ See Outer Space Treaty, article I (1,3), article II, article III, article IV (1), article V (1,3), article VIII (1), article IX.

³⁴⁷ For example, principle 8 and 9 of the Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting of 1982, principle XIV of the Principles on remote Sensing, and principle 8 of the Principles Relevant to the Use of Nuclear Power in Outer Space.

³⁴⁸ Convention on International Liability for Damages caused by Space Objects of 1972 or known as Liability Convention (adopted 29 November 1971, entered into force 1 September 1972) 961 UNTS 187.

remote sensing activities; data acquisition; data storage and data distribution; data utilization and information dissemination; funding; transitional provisions and concluding provisions³⁴⁹.

2. **Space Port**

As explained previously, being an equatorial country, Indonesia enjoys the advantages to become an ideal location for Space Port. Some countries have approached and some negotiations have been conducted, including in the form of agreements to explore possible cooperation to develop and operate space ports³⁵⁰.

Some issues that need to be further clarified and elaborated are: property rights in inventions, customs, treatment to experts, taxation, etc.

IV. CONCLUDING REMARKS

- A. Law No 21 of 2013 concerning Space Activities is opening up a new era for Indonesia especially in its effort to speed-up mastery of space science and technology and its application for the prosperity and security of the nation.
- B. As mandated by the Law No 21 of 2013, further implementing regulation should be elaborated as operational regulations.
- C. There are some challenges to be faced in the realization of such mandate such as: socialization, implementation preparation, institutional and human resources, coordination, funding, registration, licensing, state responsibility and liability.
- D. Based on the priorities, regulations on certain activities such as remote sensing and space port must be finalized as soon as possible.

³⁴⁹ The Draft Government Regulation concerning Procedures on Remote Sensing Activities consist of XV Chapters and 57 Articles.

³⁵⁰ Russia and Ukraine have signed Government to Government Space Cooperation agreement with Indonesia as umbrella agreements for further cooperation on space activities, including space port (for air launch space transportation system). Other implementing agreement such as Technology Safeguard Agreement has been signed and pending ratification by both countries.

ENSURING EQUITABLE ACCESS FOR DEVELOPING COUNTRIES IN THE UTILIZATION OF EARTH-ORBITS SPECTRUM RESOURCES*

I. INTRODUCTION

A. The Growing Numbers in the Utilization of Earth-Orbits Spectrum Resources

According to Union of Concern Scientist Satellite Database As of 11 April of 2017, the total numbers of operational satellites are 1,459, among of which 522 satellites in Geosynchronous Earth-Orbits (GEO), 96 satellites in Medium Earth Orbits (MEO), 803 satellites in Low Earth Orbits (LEO), and 38 satellites in Elliptical Orbits³⁵¹. US dominates the number of satellites with 593 satellites, followed by Peoples Republic of China with 192 satellites, Russia with 135 satellites, and the rest of countries in the world with 539 satellites³⁵².

* Lecture at APSCO Training, held at Harbin Institute of Technology, People Republic of China, July 8th of 2017

³⁵¹ See www.ucsusa.org access on June 17 of 2017. Please compare to Frazer Cain “How Many Satellites are in Space?” at <https://universetoday.com> which was accessed on June 14 of 2017 where it was stated that the numbers of operating satellites in orbits as of March 16 of 2017 were 1071 satellites.

³⁵² Ibid.

Among 593 US satellites 293 satellites are commercial satellites, 150 military satellites, 136 governmental satellites, and 10 civil satellites³⁵³.

B. The Concerns

The growing numbers of satellites to be launched and operated in outer space have raised some concerns, among others: the concerns of saturation; possible collisions among satellites caused by radio spectrum frequency interference; and inequitable access for developing countries to earth-orbits spectrum resources as limited natural resources. Some other concerns related to the environmental issues by referring to the facts that according to US Space Surveillance Network there are 21,000 objects larger than 10 cm around the earth-orbits while there are 500,000 bits and pieces between 1 and 10 cm in size surrounding the earth-orbits³⁵⁴.

C. The Need to Ensure Equitable Access

Being the late comers in utilizing earth-orbits spectrum resources, most of developing countries and countries with specific geographical situations are in need to ensure that there must be an international legal regime that would be able to ensure equitable access of developing countries and countries with specific geographical situation to earth-orbits spectrum resources.

D. Systematic

This teaching materials is prepared by first of all provide a background data why there is a need to ensure equitable access to earth-orbits spectrum resources, particularly to those developing countries and countries with specific geographical situation. The description on the anatomy of the earth-orbits is given with the objectives to have some understanding on its technical natures, characteristics and function as limited natural resources. Further, the legal concepts, status, and principles applies to it are also clarified. Some analysis on the existing

³⁵³ Ibid.

³⁵⁴ See Frazer Cain, loc.cit.

regulatory regime concerning the utilization of earth orbits both under the ITU as well as UNCOPUOS framework is very important to set up the future legal regime that would be able to provide comprehensive and equitable access to earth-orbit spectrum resources to all countries, including the developing countries and countries with specific geographical situation.

II. ANATOMY OF THE EARTH-ORBITS

A. Earth-Orbits and Its Position in Outer Space

According to scientific sources, outer space can be divided into: the solar system and deep space; the celestial bodies; inter-stellar space; circum-terrestrial space (earth-orbital space e); orbits around and trajectories to/from orbits and celestial bodies other than the earth; trajectories through inter stellar space to/from deep space³⁵⁵.

The above division clearly shows that earth-orbits constitute only a tiny part of outer space.

A Number of technical terms or jargons is being used to describe certain types of earth-orbits, for example: imperfect orbit, elliptical orbit, inclined orbit, polar orbit, sun-synchronous or helio-synchronous orbit, geosynchronous orbit, molniya orbit, inclined eccentric geosynchronous orbit, non-synchronous orbit, and geosynchronous transfer orbit.

B. The Geostationary Orbits (GSO)

GSO is a member of the family of geosynchronous orbits. The term “geosynchronous” applies to all orbits having a period of rotation corresponding to that of the earth (about 23 hours, 56 minutes). The geo-synchronous orbits apply not only to space objects in GSO, but also to those having orbits which are substantially eccentric (non-circular), inclined (non-equatorial) or both. Seen from the earth, geosynchronous space object will appear to describe a single or double loop about a point on the equator once every 24 hours. If it is assumed

³⁵⁵ See H A Wassenbergh, *Principles of Outer Space Law in Hindsight*, Martinus Nijhoff Publisher, 1991, page 40-41.

that the earth is isolated, perfectly spherical spinning mass, GSO may be defined as a geosynchronous circular orbit around the earth with an inclination of 0 (zero) degree³⁵⁶.

With its unique features or characteristics, an object being placed in GSO will remain relatively stationary in relation to a certain point on earth. Considering its physical nature and technical characteristics, GSO is best to be utilized for telecommunications, therefore, from the beginning of its utilization, GSO has been used extensively for communication satellites³⁵⁷. In addition to space communication, GSO may also be utilized for other purposes, such as: navigation, meteorology, geophysics, astronautic and even for scientific exploration³⁵⁸.

C. Low Earth-Orbits (LEO)

LEO is defined by objects orbiting the earth at less than 5500 km altitude. This equates to an orbital period of less than 225 minutes³⁵⁹. It so a spherical shell, bounded below at about 200 km by earth's atmosphere and above at about 4000 km by Van Allen Belts. Space objects cannot operate below 200 km due to atmospheric drag, while those operating above approximately 1000 km must be designed to withstand the solar wind radiation which becomes trapped in the earth's magnetic field.

Being the nearest orbital view from the earth, it offers endless scientific, commercial and public uses, as well as experimental and environmental monitoring. LEO already host a variety of space activities, such as: research, military and commercial communication satellites; storage orbits for space objects prior to their transfer to higher orbits, and temporary domicile for human launched into orbits³⁶⁰.

³⁵⁶ See Howard E Baker, *Space Debris: Legal and Policy Implications*, Martinus Nijhoff Publisher, 1989.

³⁵⁷ GSO can be used both for the Fixed Satellite Services (FSS), Mobile Satellite Services (MSS) as well as the Broadcasting Satellite Services. For further reading, see Milton L Smith, *International Regulation of Satellite Communication*, Kluwer, The Netherlands, 1990, page 2.

³⁵⁸ I B R Supancana, *The International Regulatory Regimes Governing The Utilization of Earth-Orbits*, Ph.D Thesis, Leiden University, 1998, page 14.

³⁵⁹ See Inter Agency Group (Space), *Report on Orbital Debris*, Washington, 1989, page 3.

³⁶⁰ See Howard A Baker, *op.cit*, page 23.

There are several types of LEO satellites systems, among others: Little LEO, Big LEO and Broadband LEO³⁶¹.

The increasing number of objects launched into LEO will cause growing concerns in terms of their impact to the environment, since the majority of man-made objects residing there are debris. Since space debris deposition is essentially irreversible, continued deposition increases the debris population. With larger space objects and longer orbital duration now under discussion the probability of collisions between these space objects and a space debris fragment will become greater³⁶².

D. **Medium Earth-Orbits (MEO)**

In general, MEO have similar characteristics as LEO. MEO can be elliptical or polar, located at an altitude between 10.000-20.000 km above the sea level.

Compared to LEO, for certain purposes MEO have some advantages: the number of satellites would be less than LEO, the lifetime of satellites is theoretically longer than LEO satellites, the total cost of investment are relatively lower, a MEO system is better in its spatial efficiency than LEO³⁶³.

MEO is not only ideal for Global Navigation Satellite Services (GNSS) but also for personal global mobile communication system³⁶⁴.

E. **Highly Elliptical Orbits (HEO)**

HEO is an orbit which typically has apogees at around 40.000 km and perigees at less than 1.000 km and are inclined to the equator at the unique angle of 63.4 degrees. This orbit, which is also called Molniya Orbit was pioneered by the Russian because of their requirements for communication to Northern Regions. The orbit provides a high angle of elevation even in polar regions for satellite which spend a good

³⁶¹ For further elaboration about LEO satellites systems, read I B R Supancana, op.cit, page 18-22.

³⁶² Howard A Baker, op.cit, page 23-24.

³⁶³ I B R Supancana, op.cit, page 23.

³⁶⁴ Such as: the US Global Positioning System (GPS) and the Russian Navigation Satellite System (GLONASS). While for personal global communication system among others ICO Global, Global Satellite Paging, INMARSAT C and INMARSAT M, Odyssey, and Ellipso.

fraction of their nominal 12-hour orbital period near the apogee over the Northern Hemisphere.

An operating system using this orbit needs two planes of two satellites each, with period synchronized to half of the earth's rotational period. A significant drawback on this orbit is the need for any particular satellite to pass through an Allen radiation belts four times per day.

III. SOME LEGAL CONCEPTS AND PRINCIPLES CONCERNING THE UTILIZATION OF EARTH-ORBITS

A. Legal Concepts

There are two (2) legal concepts that should be clarified that earth-orbits is a limited natural resources and earth-orbits is also a common heritage of mankind (HM).

1. Earth-Orbits as Limited Natural Resources

With the assumption that earth-orbits are a limited natural resource, two basic questions should be addressed to prove it, namely: whether earth-orbits are a natural resource and whether it is limited in nature.

There are a number of international legal documents that recognized earth-orbits spectrum resource (particularly GSO) as a natural resource, among others: the ITU Constitution of 1992³⁶⁵, The Working Paper of German submitted at Legal Sub Committee of 1986, The Group of 77 Countries Working Paper submitted at Legal Sub Committee in 1989, The Working Paper submitted by Columbia at The Legal Sub Committee in 1993.

The above documents clearly stated that GSO is a limited natural resource. The limitation in the utilization of the GSO refers to the fact that only limited numbers of satellites could be placed in GSO without causing harmful interference to one

³⁶⁵ Article 44 (2) of the ITU Constitution of 1992 states: "... , Members shall bear in mind that radio frequencies and the geostationary satellite orbits are limited natural resources and that they must be used rationally, efficiently and economically..."

another. In other words, it is limited on its capacity to support activities utilizing it. The limitation on its capacity, however, is mainly on the possibility of electromagnetic interference, rather than the possibility of causing collisions among space objects.

2. **Earth Orbits as Common Heritage of Mankind (CHM)**

Bearing in mind the fact that earth-orbits are parts of outer space and consequently not subject to national sovereignty of any state, it can be concluded that earth-orbits and its frequencies are also common heritage of mankind (CHM).

The view has been expressed that the CHM is an extension of the Res Communis Humanities concept, since it is open for inclusive use and denies exclusive use. But it goes further by asserting that there must be a sharing of benefits and the values derived from it³⁶⁶. Another view was expressed by the opinion that the CHM is the modern version of Res Communis which applies to another phenomenon, namely a right to use the resource³⁶⁷. It was further stated that a Res Communis cannot be owned, but it may be used on the basis of equality of all States. Equality presupposes that at least access to common areas beyond national jurisdiction is open to all, without any constraints, as long as it does not establish any exclusive and discriminatory uses³⁶⁸.

B. **Legal Principles Applicable to the Utilization of Earth-Orbits**

1. **Non-Appropriation**

Under the existing Space Law, the basic provisions of non-appropriation principle can be found in Article II of the Outer Space Treaty of 1967 which states that: “Outer Space, including the Moon and other Celestial Bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation or by any other means”.

³⁶⁶ Carl Q Christol, *Space Law: Past, Present and Future*, Kluwer Taxation Publisher, 1991, page 382.

³⁶⁷ Bess C M Reijnen, *The United Nations Space Treaties Analyzed*, Editions Frontieres, 1992, page 3.

³⁶⁸ *Ibid*, page 4.

On the interpretation of the non-Appropriation principle, one is of the opinion that the non-appropriation principle was adopted to implement the freedom of use doctrine, because quite simply, appropriation of a resource by a single State would usually be inconsistent with freedom of use by all States. If it is a scarce resource, appropriation is generally considered to be the taking of property for exclusive use with a sense of permanence. Appropriation of outer space, therefore, is the exercise of exclusive control or exclusive use of outer space for a permanent basis³⁶⁹. Another opinion states that every use would be legitimate so long as it does not exclude others permanently from such use or impose undue restriction³⁷⁰.

2. **Freedom of Use**

Another basic principle under the existing Space Law is the freedom of use of outer space. This fundamental freedom principle is formulated in article I (2) of the Space Treaty of 1967 which provides that: “Outer space, including the Moon and other Celestial Bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and shall be free access to all areas of celestial bodies”.

In the above provisions certain freedoms have been expressly recognized: freedom of exploration and use; freedom to get access to all areas of celestial bodies; and freedom of scientific investigation. The exercise of such freedoms, however, should be in conformity with other principles laid down in the Space Treaty, namely: the celestial bodies shall be used for peaceful purposes³⁷¹; the exercise of the freedoms shall be for the benefit and in the interest of all countries³⁷²; the exercise of the freedoms

³⁶⁹ Milton L Smith, “Compliance of the Post WARC ITU Regulatory Regimes with International Space Law” Paper presented at the IISL Colloquium, 1990, page 1.

³⁷⁰ Valters, “Perspectives in Emerging Law of Satellite Communication”, *Stanford Journal of International Studies*, vol 5, 1970, page 23.

³⁷¹ See article IV () of the Space Treaty of 1967.

³⁷² *Ibid*, article I (1).

shall be subject to international law, including Charter of the United Nations³⁷³.

3. **Peaceful Purposes**

The principle that outer space, including the moon and other celestial bodies should be for peaceful purposes can be observed in the provisions of space treaties and UNGA Resolutions. Although the principle of “peaceful purposes” was stated in different formulation, yet no single definition has been accepted.

In the Oxford English Dictionary “peaceful” means disposed or inclined to peace; aiming at or making for peace; friendly, amicable, pacific³⁷⁴. While the Oxford Handy Dictionary defines “peaceful” as characterized by peace; belonging to state of peace, not violating or infringing peace³⁷⁵.

The term “peaceful” in relation to outer space activities was interpreted by the US to mean “non-aggressive” rather than “non-military”. Accordingly, all military uses are permitted and lawful as long as they remain “non-aggressive” as per article 2 (4) of the United Nations Charter, which prohibit “the threat or use of force”. By contrast the former USSR publicly took the view, despite its own military use of space, that “peaceful” meant “non-military”, and that in consequence all military activities in outer space were “non-peaceful” and possibly illegal³⁷⁶.

4. **Equitable Access**

Another important principle that should be taken into serious consideration under the existing space law is the principle of “equitable access”. In the existing space treaties, the term “equitable access” is not mentioned. The standard terms being used in

³⁷³ Ibid, article III.

³⁷⁴ The Compact Edition of the Oxford English Dictionary, II, Oxford University Press, New York, 1971, page 2105.

³⁷⁵ The Oxford Handy Dictionary, Chancellor Press, 1986, page 650.

³⁷⁶ Ivan A Vlasic, “The Legal Aspects of Peaceful and Non-Peaceful Uses of Outer Space”, in *Peaceful and Non-Peaceful Uses of Outer Space*, Bhupendra Jasani (ed), Taylor and Francis, New York, page 40.

such treaties are: “equality”³⁷⁷, “equitable sharing”³⁷⁸, “equitable measures”³⁷⁹, and “equity”. In contrast, the term “equitable access” is being used in the international telecommunication conventions³⁸⁰.

The Black Law Dictionary defines the term “equitable” as “just, fair and the right in consideration of the facts and circumstances of the individual case”. While the Oxford Handy Dictionary defines it as “fair, just, valid in equity”³⁸¹. “Equity” is defined as “fairness, use of principles of justice to supplement law, system of law so developed”,³⁸² and “equality” is defined as “being equal, become equal”³⁸³.

“Equitable” should, in a broader sense, mean to cover “balanced, just, fair and proportional in relation to certain special condition (circumstances)”. In practical situations such interpretation would preclude excessive/unproportionally, unjust, unbalanced and unfairness. More over the principle of equitable should meet not only existing needs, but also future needs.

IV. EXISTING LEGAL REGIMES GOVERNING THE UTILIZATION OF EARTH-ORBITS SPECTRUM RESOURCES

A. General

In order to provide a picture about existing regulatory regime concerning the utilization of earth-orbits spectrum resources, it is important to examine regulatory process within relevant international organizations, particularly in the frame work of the International Telecommunication Union (ITU) and the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS).

³⁷⁷ See article I and X of the Outer Space Treaty of 1967.

³⁷⁸ See article 11 (7) of the Moon Treaty of 1979.

³⁷⁹ See paragraph 4 of the Preamble of the Liability Convention of 1972.

³⁸⁰ See article 33 (2) of the ITU Convention; Resolution no 3 of the WARC 1979; article 33 ITU Convention 1982; article 44 of the ITU Constitution of 1992.

³⁸¹ The Oxford Handy Dictionary, op.cit, page 287.

³⁸² Ibid.

³⁸³ Ibid.

B. Under the ITU Framework

1. Plenipotentiary Conferences

The initial discussion on the utilization of earth-orbits spectrum resources particularly on allocation of frequencies for space activities were started at the 1959 Plenipotentiary Conference. It was in 1973 for the first time GSO was stated as limited natural resources. In the 1982 the “first come, first served” principle was revised in order to provide greater access for developing countries. The structure and functioning of ITU was then reviewed in 1989 followed by the establishment of new structure and functioning of the ITU in the form of new Constitution and Convention in 1992 as a way to accommodate the future development. There was also initiative the review of frequency coordination and planning framework for satellite network at Plenipotentiary Conference in 1994.

2. World Administrative Radio Conferences (WARC) and World Radiocommunication Conferences (WRC)

On the issues of the GSO, the WARC of 1979 adopted a certain apportionment of the frequency bands by which greater protection was given to higher frequency categories used more by developed countries. Some procedures were also changed to allow greater access by developing countries³⁸⁴.

At the WARC-ORB of 1985 4 key issues were identified during the conference to be used as materials, they were: protection of the existing system; allotment planning and simplified improved procedures; preservation of the GSO from saturation; eliminating the abuse of its use only for peaceful purposes; taking into account the economic and technical development of developing countries and the geographical situation of every country³⁸⁵.

The WARC-ORB of 1988 failed to produce a grand scheme, a Magna Charta of the GSO as its title and principal mandate might have suggested. It did not attempt to regulate nor even set

³⁸⁴ See Bogaert, *Aspects of Space Law*, Kluwer, The Netherlands, 1986, page 196.

³⁸⁵ Milton L Smith, *op.cit*, page 90-91.

programmatic standard for regulating all space communication traffic and allocation of orbital slots. Instead, it limited itself to re-regulating space communications in one particular service, the FSS³⁸⁶. Among 17 space communications services at the time, only the broadcasting satellite services is subject to apriorism planning. Even within the FSS not all frequency bands were regulated by apriorism allotment plan schemes. Only the so-called expansion bands were affected. In that area, however, new ground was broken; every country obtained a guarantee to at least one orbital location and 800 MHz of usable bandwidth³⁸⁷.

From the perspectives of two conflicting parties, namely developed countries and developing countries, the result of WARC-ORB and 1988 can be seen as a compromise formula. On the one hand it satisfies the interest of the Third World by giving access to the utilization of earth-orbits spectrum as limited natural resources, although limited in scope. On the other hand, the developed countries have also gained, they can still access most parts of the radio frequency spectrum without cumbersome bureaucratic restrictions and fee³⁸⁸.

C. Under the UNCOPUOS Framework

1. The Existing Space Treaties

Under the existing space treaties, regulation concerning earth-orbits can only be found in article IV of the Space Treaty of 1967. It uses a very general formulation and only related to peaceful activities in earth-orbits, while it does not touch on any issue with regards to its commercial utilization. Nevertheless, as earth-orbits are parts of outer space, the principles laid down in the existing space treaties may be applied as guidelines for the utilization of earth-orbits.

2. Legal Sub Committee Meeting of the UNCOPUOS

³⁸⁶ See Siegfried Wiessner, "The Art of Possible: A Review of Space WARC 85-88", page 4.

³⁸⁷ Ibid.

³⁸⁸ Ibid, page 6.

Some highlights can be drawn from all the discussions on the utilization of the earth-orbits spectrum resources (especially GSO) within the framework of the Legal Sub-Committee of the UNCOPUOS. However, some common elements were seen to be agreed upon, such as:

- a. Physically GSO has generally been recognized as a part of Outer Space;
- b. That GSO is a limited natural resource;
- c. There is a need to prevent saturation resulting from its utilization;
- d. The utilization of the GSO should be conducted in a rational, equitable, efficient, economical manner to ensure the access of all countries to this orbit/spectrum resource;
- e. The need to formulate a Sui Generic regime concerning the utilization of GSO.

V. THE PROSPECTS OF ENSURING EQUITABLE ACCESS OF DEVELOPING COUNTRIES IN THE UTILIZATION OF EARTH-ORBIT SPECTRUM RESOURCE

A. The Need for A Comprehensive International Legal Regime (Sui Generic Regime) on the Utilization of Earth-Orbits Spectrum Resource

1. Why a Comprehensive Legal Regime is Required?

A comprehensive legal regime governing the utilization of earth-orbits spectrum resource are based on several considerations, among others:

- Inequalities in the existing utilization of earth-orbits spectrum resources;
- The existing regulatory regime only focus on technical regulations and lacks of legal principles;

- The approach to the current regulatory regime is confined to its utilization and not quite integrated and comprehensive;
- The need to have a better regulatory regime which could ensure fair, rational, efficient and economic use of earth-orbits spectrum resources as limited natural resources.

2. **The Characteristics**

Some characteristics of a comprehensive regulatory regime governing the utilization of earth-orbits spectrum resources can be described as follows³⁸⁹:

- It consists of several separate regulations but forms a comprehensive and integral system;
- It applies internationally;
- It is created as a supranational legislation equipped with effective law enforcement mechanism;
- Its Implementation through various institutions provided that it is bound by effective cooperation mechanism;
- It shows flexibility to cover future development in many aspects;
- It is environment oriented to ensure sustainable utilization.

3. **The Objectives**

The objectives of formulating a comprehensive legal regime concerning the utilization of earth-orbits spectrum resources are³⁹⁰:

- To ensure equitable access for all countries, particularly developing countries and countries with specific geographical situation;
- To ensure fair and orderly utilization;
- To guarantee sustainable utilization;

³⁸⁹ For further elaboration, See, I B R Supancana, op.cit, page 258. See also I B R Supancana, "Securing Access to Orbit-Spectrum Resources: Common Interest for Asian-African Countries", Paper presented at Satellite Experts Meeting, Jointly Organized by Ministry of Foreign Affairs Republic of Indonesia and Indonesia Satellite Association (ASS), Bandung 26-27 June of 2007.

³⁹⁰ Ibid, page 258-259.

- To protect rights of legitimate user;
- To ensure rational and efficient use;
- To improve regulation on procedures of access;
- To prevent the abuse of registration procedures and acquired rights;
- To prevent harmful interference among users.

B. Elaboration of Equitable Access in the Utilization of Earth-Orbit Spectrum Resources

1. Status

Is one of the general principles of law such as good faith, state responsibility, liability for damages, estoppel, etc. As a general principle of law becomes a source of international law.

2. Interpretations

At first “equitable access” was implemented on “first come, first served”, but later on changed to cover the needs of subsequent users (the allotment plan, simplified improved procedures, and multilateral planning meeting).

3. Criteria's

There are some criteria's that can be used to elaborate equitable access, which include:

- The balances need of the first user and subsequent user;
- The ability to get access (both technically and financially);
- The interest of developing countries;
- The geographical situation of particular countries;
- The development in the field of space science and technology;
- On a non-discriminatory basis to guarantee future access.

4. Legal Parameters

Some legal parameters shall be formulated to secure equitable access of developing countries, covering:

- To provide the opportunity to the first user without preventing the same opportunity (on non-permanent basis) to subsequent user such as developing countries or countries with specific geographical situation;
- Based on proportionality and not excessive to the actual needs of each country;
- On a non-discriminatory basis;
- Taking into account the specific condition of individual countries (geographical situation, financial condition, technical capabilities, needs, etc.);
- The opportunity that every state has at least one slot.

C. The Formulation of International Regulatory Regimes to Ensure Equitable Access in the Utilization of Earth-Orbits Spectrum Resources

1. An Improved Management concerning the utilization of Earth-Orbits Spectrum Resources can be done through³⁹¹:
 - Frequency sharing;
 - Co-location;
 - Imposing certain measures to prevent bureaucratic congestion;
 - Developing a satellite slot market;
 - By auctioning certain frequency spectrum;
 - Implementing global spectrum segmentation plan;
 - Simplification and improvement of registration procedures;
 - Formulating rights and obligations of registered users.
2. Developing Legal Principles and Regulations concerning the Utilization Earth-Orbits Spectrum Resources³⁹²
 - Developing system for state responsibility and liability;
 - Developing principles on traffic rules;

³⁹¹ See, *Ibid*, page 260-261.

³⁹² See *Ibid*, page 262-286.

ENSURING EQUITABLE ACCESS FOR DEVELOPING COUNTRIES IN
THE UTILIZATION OF EARTH-ORBITS SPECTRUM RESOURCES

- Developing an effective dispute resolution mechanism;
- Taking into consideration environmental preservation to ensure sustainable utilization of earth-orbit spectrum resource;
- Empowering and promoting cooperation among relevant international organizations (especially between ITU and UNCOPUOS).

INDONESIAN SPACE POLICY, REGULATIONS AND PROGRAMS: PAST ACHIEVEMENTS AND FUTURE PROSPECTS*

ABSTRACT

With one of the oldest national space programs in the world, Indonesia is a driving force in the development and utilization of space technologies in Asia–Pacific. Since its foundation in 1963, the National Institute of Aeronautics and Space (LAPAN) has conducted advanced research and development in satellite and rocket technologies, in accordance with ambitious and carefully crafted national space laws, regulations and policies. In this chapter, Professor Ida Bagus Rahmadi Supancana provides a comprehensive historical overview of the Indonesian national space development program with a strong emphasis on law and policy. Then, he outlines possible future directions of national space efforts, based on a thorough analysis of the Indonesian government’s latest strategies and roadmaps for space activities.

I. INTRODUCTION

A. Characteristics of Indonesia

Indonesia is the largest archipelagic country in the world with more than 17.504 islands. The total territorial jurisdiction is about 8 million km², two-third of which are waters. The distance from the Western Part

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of Indonesia (Sabang) to the Eastern Part of Indonesia (Merauke) is around 5000 km. Indonesia also possesses the second longest coastline in the world of about 80.000 km. Another important geographical feature is that Indonesia is situated on a ring of fire (volcanic) which also makes it a disaster-prone country.³⁹³

From the demographic perspective, the population of Indonesia is of more than 268 million people¹ and consists of different ethnicities spreading across the country, using around 749 languages.

B. Indonesian Dependency on Space Science and Technology and Its Applications

The specific geographical and demographical situation of Indonesia have made it dependent to the applications of space science and technology to accommodate national interests, both from prosperity as well as security approaches. Space science and technology are applied in the following fields to accommodate national interests, among others: telecommunication, remote sensing, direct broadcasting, weather forecasting, disaster mitigation and management, information and communication technology, resource management, city planning, defense and security, education and training as well as poverty alleviation.

C. The Need for a Comprehensive Picture of the Indonesian Space Policy, Regulations and Programs Both Past, Present and Future

This article aims at exploring relevant fact and issues concerning the Indonesian Space Policy, Regulations and Programs, covering both their initial stages, the relevant institutions dealing with space policies and implementation, regulatory framework, and international cooperation principles and mechanisms. The above issues will be seen from the perspectives of past, present and future.

³⁹³ As of 12 August 2020, in accordance with the Directorate General of Citizenship and Civic Registration, Ministry of Home Affairs of the Republic of Indonesia.

II. **INDONESIAN INITIAL SPACE PROGRAMS AND ACHIEVEMENTS**

A. **International Geophysical Year of 1957–1958**

The history of the first Indonesian involvement in outer space activities can be traced back the International Geophysical Year (IGY) of 1957–1958. The results of the IGY meeting were quite spectacular, including the launch of Sputnik I, Explorer, etc. which brought humankind to a new dimension, the outer space.

During the IGY meeting, Indonesia was categorized as a “Black Area”, while some other developing countries in Asia like India and Pakistan had launched scientific research rockets. Egypt had also developed ballistic missiles assisted by German scientists, followed by the plan to orbit the Al-Negma satellite as well as national astronauts

B. **Initial Space Programs**

The first research project was called PRIMA, for “Pengembangan Roket Ilmiah dan Militer Awal” meaning “Early Scientific and Military Rocket Development”. The Kartika I rocket was one of the achievements of this project. It was quite successful. In cooperation with the electronics laboratory of the Bandung Institute of Technology, the PRIMA project led to the successful development of a telemetry system and managed to obtain telemetry information from the American TIROS-1 weather satellite. Indonesia was the second after India which had similar achievement. Kartika I was launched from the Pamengpeuk space site in West Java Province.

Another project called Project S-1 was developed in parallel with the Kartika Project, involving University of Tokyo Professor Hideo Itokawa, designer of the Japanese Imperial Army fighter plane Ki-43 Hayabusa during World War II, who later became one of the pioneers of Japanese rocketry. The personnel of Project S-1 were actually the same as Kartika I. The S-1 Project used the Japanese experimental Kappa 8 rocket system as the basis of its technology development endeavors. Such rocket had the capabilities to lift the load of maximum

50 kg at the height of 200 km. For this project a launching station was built at Cilauteureum, close to Pamengpeuk (West Java), including installation of all relevant facilities.

In August 1965, Kappa 8 series rockets had even reached the altitude of 364 km. Such achievement was very important for Indonesia since it was the first time such rocket was launched into outer space from the Indonesian soil, and even the apogee was higher than the orbit of astronauts and cosmonaut at that time. It also marked the new record of rocket launched from the Equator. The mission also succeeded in acquiring scientific data which contributed to the International Quite Sun Year (IQSY) meeting in 1964–1965.

C. **Basic Space Policy**

Paragraph 4 of the Preamble of the Indonesian 1945 Constitution clearly states the objectives of establishing the Unitary State of Indonesia, among others: to promote general welfare, general standard of education of the people and to maintain international order based on peace, eternal independence and social justice. As the 1945 Constitution (as amended) is one of the primary sources of law within the framework of the Indonesian legal system, thus the norm of the Constitution shall govern the formulation of any State policy, including space policy.

Another consideration is, of course, the national interest in space. The national interests in space are reflected in the: outer space vision of the founding fathers and its predecessors; the specific geographical situation of Indonesia; Prosperity and security interest; and access to outer. The pursuance of national interest in space, however, shall be conducted in such a manner that respects the legitimate rights of other countries and the existing International Law. Moreover, the formulation process of space policy shall take into consideration the present and future developments in the field of space science and technology and its applications.

Law. Moreover, the formulation process of space policy shall take into consideration the present and future developments in the field of space science and technology and its applications.

D. The Establishment of the Indonesian Aeronautics and Space Council (DEPANRI) and the National Institute of Aeronautics and Space (LAPAN)

At the time of initial space programs, there was no official institution to coordinate space activities. The idea of establishing a national aeronautics and space institute arose. At the same time the idea of establishing a council to deal with policy issues also arose.

The Aeronautics and Space Council of the Republic of Indonesia (DEPANRI) was established by Presidential Decree no. 24 of 1963 as the highest coordinating body for the formulation of aerospace policy. DEPANRI was chaired by the President of the Republic of Indonesia with members consisting of the Minister of State Research and Technology, Minister of Defense, Minister of Trade, Minister of Industry, and Minister of State Development Planning. The main duty of DEPANRI was to assist the President in formulating general policy in the field of aviation and space. DEPANRI was obliged to provide considerations, opinion and advice to the President regarding legislation and utilization of air space and outer space for the aviation, telecommunication and other national interests. The history of DEPANRI policy coordination activities is further developed in Sect. 2.5.4.

LAPAN was established by Presidential Decree no. 236 on 27 November 1963. In its considerations it was stated that the progress in aviation and space activities in the World had become a factor which would affect both safety and security of mankind and have become field of activities of many countries. In that respect, Indonesia needed to adjust to such development in order to achieve its objectives. It was therefore important to bring some progress and to improve national activities in the field of aviation and space activities equal to the progress made by other countries. The Presidential Decree states that LAPAN was established to become an implementing agency at the national level to advance aviation and space activities through research and development or other measures [Article 1]. The main tasks of LAPAN are [Article 2]:

1. Conducting research and development on all required issues to enable the implementation of national activities both terrestrial and non-terrestrial;
2. To improve the national capabilities of both the air force as well as space activities by developing the existing elements and planning to materialize other needed elements;
3. To promote national aerospace mindedness, including to develop human resource capabilities as a part of aerospace power;
4. To promote international relations and cooperation among countries.

III. FURTHER DEVELOPMENTS RELEVANT TO OUTER SPACE ACTIVITIES

A. 1963–1978

During this period of time some space-related activities have been conducted, among others:

1. Siprus Project, for “sistem informasi real time menggunakan pesawat udara dan satelit” meaning “a real time information system by using both aircraft and satellites” (1975);
2. Aerospace Research Pioneer (Rintisan Riset Dirgantara). The Government launched the project on April 1st of 1974. The objectives were, among others: to fix the rocket launch station at Cilauteureum and to reactivate upper ionosphere research. This project involved a cooperation between LAPAN and CNES, the French space agency. Such research enabled data acquisition to be applied for weather forecasting, aviation safety, communication and research on the influence of outer space toward our lives.

B. 1979–1989

During this decade, the focus of LAPAN was to formulate programs by emphasizing the utilization of space science and technology to support the achievement of national development objectives and to gradually

lift or promote its capabilities to conduct research and utilization of outer space without entirely depending on foreign assistance.

The research programs covered:

1. The Development of Rocket Propulsion System and Instrumentation of Meteorological Rocket Devices/Equipment
In this period LAPAN acquired the capabilities to make rockets X-150 and X-250 variants based on previous technology. This rocket with polyurethane fuel was successfully launched on November 19 of 1987.
2. Design Satellite Project (Proyek Desain Satelit/Sainsat)
Since the launch of the Palapa geostationary satellite in 1976, first domestic communication satellite system in a developing country, additional research has been conducted to develop Indonesia-made satellites. In order to reduce dependency to foreign technology some efforts are directing toward mastering satellite technology through technology transfer.
3. Self-supported Domestic Satellite System and Its Orbiting Rocket (Proyek Swasembada Sistem Satelit Domestik dan Roket Pengorbitnya/Swasta)
Some studies have been conducted in cooperation both with local institutions as well as foreign such as CNES, the DFVLR (Deutsche Forschungs-und Versuchsanstalt für Luft-und Raumfahrt, predecessor of the German Aerospace Center-DLR), the BAC (British Aerospace Company), NASA Wallops, Martin Marietta, and the Aerojet Liquid Rocket Co. The scope of the studies included plans to study ground stations for rocket tracking; study to use natural resource payload; and study on some equipment such as static test and building of required laboratory.
4. Energy Aerospace System (Spin Off)
The activities include collecting data on wind energy in 12 selected provinces across the country.

C. 1990–2000

1. Reorganizing DEPANRI (Indonesian Council for Aviation and Space)

DEPANRI was reorganized as the highest coordinating forum for policy formulation regarding national aviation and space activities.

2. Construction and Operations of the Pare-Pare Earth Remote Sensing Satellite Receiving Station

Pare-Pare was chosen because it was able to cover 95% of national territory. Other receiving stations are located in Biak and Pekayon. The stations received satellite imagery from satellites such as SPOT-2, Landsat-5, Landsat ETM, SPOT 2, SPOT 3, ERS-1, ERS 2, etc.

3. Rocket System Development

In the 1990s, rocket research and development achieved some improvements on several aspects, such as: rocket flight stabilization, rocket characteristic and trajectories, RX 150 capabilities with DART, rocket multi stages separation system, passive control, rocket stabilization standardization system. Multi stages RX 250 had also been developed although the whole testing was conducted at the laboratory.

D. 2001–2011

1. Equatorial Atmospheric Radar Operations

The operation of the Equatorial Atmospheric Radar (EAR) in cooperation with Kyoto University's Radio Science Center for Space and Atmosphere (RASC) had been successfully conducted.

2. LAPAN-TUBSat Satellite Development

LAPAN decided to develop microsattellites due to some considerations, such as: the advanced technological stage and relatively simple technology; it was therefore easier for mastery of such technology. In cooperation with DLR (German Aerospace Center) and the Technical University of Berlin, LAPAN developed

the satellite and, in cooperation with Indian Space Research Organization (ISRO), launched it from the Satish Dawan Space Center on January 10 of 2007.

The satellite had the following characteristics: weight of 57 kg, 45 cm long, 45 cm width, 27 cm tall. With its polar orbit the satellite passes the Indonesian territories twice a day. It is also equipped with 2 video cameras. One camera with wide coverage had a resolution of 200 m and a coverage of 81 km, while another camera had a high resolution of 5 m and its coverage was around 3–4 km.

The special qualities of the satellite were, among others: attitude control system consisting of 3 reaction wheels, 3 gyros, 2 sun sensors, 3 magnetic coils and a star sensor to navigate the satellite. Moreover, the satellite was quite sophisticated comparing to other similar microsattellites. 5 NiH₂ batteries with the capacity of 12 Ah were added in order to be able to operate and the records of its data could be received by LAPAN's earth receiving station at Rumpin, Bogor. LAPAN-TUBSat was orbiting at the altitude of 630 km.

3. INASat-1

Initial developments of national satellites focused on nanosatellites with a weight of less than 20 kg. LAPAN in cooperation with PTDI (Indonesian Aircraft Manufacturing Company) developed the satellite designed to be placed in low-earth orbit at the altitude of around 725 km above the sea level. With its inclination the satellite was designed to pass over the Indonesian territory 5 times a day and the orbital path is Sun Synchronous Polar.

4. The Development of Satellite-Orbiting Rocket (Roket Pengorbit Satelit/RPS)

Since its establishment LAPAN attempted to develop its capabilities in rocket technology. Some variants of rockets have been developed and tested, including but not limited to: RX-320, RX-420.

E. Law No. 21 of 2013 on Space Activities and Its Implementation

1. The Long Process of Formulating Law No. 21 of 2013

The process of formulating national space legislation in Indonesia has taken quite some time. The various steps are, among others.

a. Initial Initiatives and Studies

Some initial steps were taken in the 1980s as preliminary preparations including setting up an inter-departmental working group to examine the viability of formulating national aerospace law, which further focused on preparing national space legislation.

In parallel with the initial steps, some studies were conducted on the urgency and feasibility to ratify relevant space treaties in order to make sure that the proposed national legislation would be in conformity and in accordance with international standards of national space legislations. As the result, four out of five space treaties had been ratified, and the norms of such treaties had been incorporated into the draft of national space legislation: the Outer Space Treaty of 1967 was ratified by the Law no. 16 of 2002; the Rescue Agreement of 1968 was ratified by the Presidential Decree no. 4 of 1999; the Liability Convention of 1972 was ratified by the Presidential Decree no. 20 of 1996; and the Registration Convention was ratified by the Presidential Decree no. 5 of 1997.

As a part of the preparation of the national space legislation, some preliminary research has been conducted, including but not limited to:

- Study on the interpretation and implementation of international space treaties as considerations for developing national space legislation;
- Comparative study on the national space legislations in several countries in order to decide the best model of national space legislation which fit the conditions

of Indonesia, including the United States, the United Kingdom, France, Russia, Australia, Sweden, and South Africa;

- Study on the possibility to adopt some principles as formulated in existing UNGA Resolutions related to space activities;
- Study on some important concepts and regulations for conducting space activities, such as liability issues, national licensing, registration system, definition/delimitation of outer space, environmental issues, commercial utilization of outer space, institutional issues;
- Study on some other international instruments and national space legislation of other countries which reflect common elements (common main provisions) of national space legislations for considerations to be incorporated into the national space legislation (Indonesian Space Act).

b. Deliberation and Enactment Process

In total, from the first academic draft and draft law which was prepared in 2003, it took around 10 years to deliberate and enact the national space act. The first draft consisted of 16 chapters and 51 articles, while the final draft which was submitted to the Parliament consisted of 21 chapters, 105 articles and explanatory notes (on the Academic Draft and the First Draft Law on Space Activities).

The deliberation process in the Parliament was started by an initial meeting between the Executive (the Government) and the Legislative (the Parliament) branches. The inventory of issues indicated a total of 571 issues, 366 of which were not changed and therefore not discussed, while 137 issues were discussed in the Working Committee (Panja), 10 by the Formulating Team (Tim Perumus) and

101 by the Synchronization Team (Tim Sinkronisasi). Prior to the deliberation process, public hearings were conducted by inviting experts of relevant fields, and other relevant stakeholders, including legal and language experts (for further elaboration on the deliberation process of Law no. 21 of 2013 concerning Space Activities). Finally, on 9 July 2013, the draft law was endorsed by the Parliament in its plenary session to be signed by the President within 30 days. The Law was enacted as Law no. 21 of 2013 concerning Space Activities.

c. The Characteristics and the Main Provisions

In general, the characteristics of Law no. 21 of 2013 are: visionary, outward looking, balancing national interests and international obligations, comprehensive, and taking into account international standards and practices.

The Law no. 21 of 2013 consists of 19 chapters and 105 articles and explanatory notes. The main provisions are general provisions; the scope of space activities; the governance of space activities; direction and supervisory system; space-ports; safety and security; search and recovery; state responsibility and international liability; registration system; international cooperation; insurance; financing; community participation; civil and administrative sanctions; criminal provisions; provisional provisions; concluding provisions.

d. Challenges for Its Implementations

Based on Law no. 21 of 2013, there are some mandates for further elaboration into operational regulations which spread out in some articles of Law no. 21 of 2013 and cover variable issues, among others (for further elaboration on the deliberation process of Law no. 21 of 2013 concerning Space Activities):

e. Formulation of Space Blueprint

The national space agency (LAPAN) shall formulate a blueprint as a guideline to conduct space activities. The blueprint shall be formulated by taking into account basic capital and strategic environment. Such blueprint shall contain vision and mission, policy, strategy and transformation roadmaps for the short, medium as well as long terms. The blueprint shall be for a period of 25 years [Article 40].

Based on the implementation mandate under Law no. 21 of 2013, a Presidential Regulation on Space Blueprint has been enacted, namely Presidential Regulation no. 45 of 2017 concerning Space Blueprint 2016–2040.

f. Remote Sensing Activities

Remote sensing activities cover both data acquisition, data processing, data storage, data utilization, and information dissemination. It is mandated that further provisions of conducting remote sensing activities shall be regulated by Government Regulations [Article 23].

As the implementation of the above mandate, Government Regulation no. 11 of 2018 concerning Remote Sensing Activities have been enacted.

g. Mastery of Space Science and Technology

Indonesia being an archipelagic and disaster-prone country, dependent on space science and technology and its applications, mastery of space science and technology is a necessity. Mastery of space science and technology shall include rocket technology, satellite technology, aeronautical technology and spin-off technology. This can be done among others by transfer of technology. To achieve such objectives, the procedures and mechanism of implementation shall be regulated in accordance with laws and regulations [Article 26, para (3)].

h. Sensitive Technology

By recognizing that any efforts to achieve mastery of outer space technology will deal with security aspects of sensitive technology, it is therefore important to ensure the security which is intended for peaceful, national interests and compliance with international obligations. For that purpose, the procedures and mechanisms related to sensitive technologies shall further be regulated by Government Regulations [Article 27, para (3)].

i. Procedure of Space Launching

The launching activities can be conducted, both from the territorial sovereignty, jurisdiction as well as a vessel or aircraft of Indonesia, or even from a foreign vessel or aircraft within the territory or jurisdiction of Indonesia. There is also a possibility from foreign territory as long as the vehicle belongs to the Republic of Indonesia.

Further regulation concerning the procedure of launching and to fulfill certain requirements as imposed by the Law no. 21 of 2013 shall be regulated by the National Space Agency [Article 36].

j. Commercialization of Space Activities

In line with the progress in space science and technology and its application, commercialization of space activities will become inevitable. Commercialization of space activities may cover telecommunication, direct broadcasting, remote sensing, space tourism, space mining, space financing, space insurance, space settlements, etc.

One of the objectives of formulating national space legislation is to ensure that all space activities, including commercialization of space activities can be conducted in an orderly manner and shall be for the benefit of mankind. Although the Law no. 21 of 2013 only contains one article dealing with commercialization of space activities, it is

mandated that further regulation shall be formulated in the form of a Governmental Regulation [Article 37, para (3)].

In 2020, a draft Government Regulation on Procedures on Commercialization of Space Activities has been prepared by LAPAN. Public consultation meetings were held to accommodate the aspiration and interests of main stakeholders, interest groups, advocacy group, academician as well as business associations and public at large.

k. The Structure of the National Institute of Aeronautics and Space (LAPAN)

One of the most important provisions of the Law no. 21 of 2013 concerning Space Activities is to enlarge and empower the existing national space agency, LAPAN. The consequence of such provision is that there is a need to elaborate the main tasks and functions of LAPAN into a new structure, the structure of which shall be regulated by a Presidential Regulation [Article 38, para (4)]. To strengthen the role of LAPAN in coordinating Space Activities, Presidential Regulation no. 49 of 2015 has been enacted.

l. Spaceports

Being an equatorial country, Indonesia enjoys the benefit to become an ideal location for a spaceport. Considering such advantages, some countries have offered the possibility to cooperate to build and operate a spaceport within the territory of the Republic of Indonesia. The proposed spaceports can be conventional ones as well as non-conventional ones such as the use of an airfield as intermediate air launch for space transportation system and even in the form of a mobile spaceport for sea launch.

Theoretically spaceports can be developed by Government as well as by other non-State space actors provided that they acquire relevant licenses and approvals from the Government. As the activities at the spaceport and

its surroundings pose some possible dangers, it is required to be elaborated into a Governmental Regulation. Such Government Regulation would cover provisions on the procedures of construction and operation of a spaceport [Article 50].

m. Procedure of Accident Investigation

As space activities are extra hazardous and ultra-hazardous activities, they are prone to a possible accident. The impact of space accident may be catastrophic. Space accidents can be in the form of re-entry of space objects as well as collisions among space objects, both active and inactive ones. After an accident there is a need to conduct accident investigation in order to identify the cause of such accident and to determine the potential danger it may cause. The member of the accident investigation team shall comprise experts in many relevant fields. Considering the complexity of aspects in conducting space accident investigations, the provision of Law no. 21 of 2013 concerning Space Activities states that further provisions regarding the procedures of conducting accident investigations shall be regulated by the regulation of the relevant agency (in this case LAPAN) [Article 68].

n. Suspension of Launching License

As stated in the provision of article 69 of Law no. 21 of 2013 concerning Space Activities, immediately after an accident occurs, the launching license and other related launching activities shall be suspended. The provisions regarding the criteria and requirements for suspension, freezing, revocation and alteration of launching licenses shall be regulated by a Government Regulation [Article 69, para (5)].

o. Liability and Compensation

In any activity, including space activities, accidents may happen and consequently any damages caused by space

activities shall be subject to liability and compensation. The provision on the issue of liability and compensation under the Law no. 21 of 2013 concerning Space Activities covering broad aspects, it covers not only Government's liability to foreign as well as domestic nationals, but also regulate other issues, such as: basis of liability, recoverable damages, procedure for claiming of compensation, transfer of ownership and its impacts toward liability, jointly and severally liability, and liability for space activities. As liability and compensation are complex issues, further detailed regulation is needed and to be regulated by a Government Regulation [Article 83].

p. Insurance

Being a risk-prone activity, in conducting any space activities there is a need to cover possible risks and also to allocate risk by way of insuring it. Law no. 21 of 2013 imposes the obligation to any space operator to insure its risks, particularly third-party liability risks. The provision of risk insurance will further be regulated by a Government Regulation [Article 84, para (3)].

q. Community Participation

In any laws, it is common to regulate the provisions concerning Community Participation. This is a logical consequence of democracy. Law no. 21 of 2013 opens equal and broad opportunity for community participation. The main objective of such provision is for enhancement and optimization of benefits in conducting and managing space activities. Community Participation can be in the form of monitoring, providing input and advise for improving regulation, submitting opinions and considerations, giving priority and promoting space activity, up to submitting class action.

It is mandated under this law that further provisions concerning Community Participation shall be further

elaborated in the form of a Government Regulation [Article 92].

IV. MASTER PLAN FOR SPACE ACTIVITIES 2016–2040

A. Legal Mandate

The formulation of Presidential Regulation no. 45 of 2017 concerning the Master Plan for Space Activities 2016–2040 is based on the mandate from article 40 of Law no. 21 of 2013 concerning Space Activities.

1. Main Provisions

a. Period

The Master Plan of Space Activities applies for the period of 25 years, from 2016 to 2040 [Article 1].

b. Scope, Basic Capital and Strategic Environment [Article 2]

– Scope

The scope of the Master Plan includes vision and mission; policy; strategy; and roadmap for short, medium and long terms.

– Basic Capital

The basic capital for the implementation of the Master Plan shall include natural resources; human resources; geographical position; science and technology; and space capabilities.

– Strategic Environment

The strategic environment consists of politics and law; the influence of global economic development; the development of science and technology; and the opportunity for regional as well as global cooperation.

2. Master Plan as a Guidance [Article 3]

As a guidance, the Master Plan binds and shall be used as reference by all ministerial and non-ministerial institutions both at the central government as well as regional administrations as long as it is related to space activities. For this purpose, the national

institution with the main function of handling government affairs relevant to space activities shall conduct coordination and synchronization with other relevant governmental institutions.

3. **The Institution Responsible for Monitoring and Evaluation [Article 4]**

The head of the institution with the main task of conducting governmental affairs related to space activities shall conduct evaluation and monitoring on the implementation of the Master Plan. The result of monitoring and evaluation activities shall be reported to the President via the Minister in charge of government affairs in the field of research and technology.

4. **Periodical Review [Article 5]**

At least once every five (5) years or based on actual needs and the result of monitoring and evaluation, the Master Plan shall be reviewed/revisited.

5. **Entry into Force [Article 6]**

Presidential Regulation no. 45 of 2017 concerning the Master Plan for Space Activities entered into force at the time it was enacted on April 11 of 2017.

6. **Annex to the Presidential Regulation No. 45 of 2017 Concerning the Master Plan for Space Activities**

The Annex to Presidential Regulation no. 45 of 2017 concerning the Master Plan for Space Activities is an inseparable part of Presidential Regulation no. 45 of 2017, though it is more elaborated and equipped with its timeframe.

7. **Vision and Mission**

a. Vision

The vision of space activities in the framework of the Master Plan of Space Activities is to ensure the Independence, Advancement and Sustainability of Indonesian space activities.

b. **Mission**

For the implementation of the Vision, the Mission consists of:

- Strengthening research and development in the field of space and atmospheric science and its utilization;
- Strengthening Remote Sensing activities;
- Strengthening research and development on technological engineering in aviation and space and its utilization toward national independence;
- Developing independence in launching space objects through development of spaceports within the territory of Indonesia;
- Promoting commercial space activities by involving national industry.

8. **Policy**

For the implementation of Space Vision and Mission, the policy is directed towards:

- a. mastering a world class space science, including atmospheric science in Indonesia;
- b. conducting world class remote sensing activities based on fulfillment of national needs through cooperation;
- c. mastering space technology through advancing rocket technology, satellite technology, aeronautical technology and national industry based on fulfillment of national needs by way of cooperation;
- d. conducting launching activities through the construction and operation of space-ports, including research airports within the territory of Indonesia by involving relevant governmental institutions and local governments;
- e. promoting commercial space activities by involving state-owned enterprises, industrial sector or private sector.

9. **Strategy**

In preparing strategy for the implementation of space Vision, Mission and Policy, it requires basic capital in the form of natural resources, human resource development, geographical condition, mastering of space technology, and space capabilities. Based on the above basic capital, the strategies are formulated as follows:

- a. The strategy to strengthen research and development on space and atmospheric sciences and its utilization;
- b. The strategy to be implemented to strengthen remote sensing activities;
- c. The strategy to be implemented to strengthen research and development and technological engineering on aviation and space and its utilization toward national independence;
- d. The strategy to develop independence in launching space objects through construction and operation of spaceports within the territory of Indonesia;
- e. Strategy to promote commercial space activities by involving national industry.

10. **Short, Mid and Long Terms Strategic Roadmaps**

- a. Space Science
 - Short Term (2020): Development of the “decision support system (DSS)” of space and atmospheric science as benchmark concerning climate change, variability of atmosphere and space, and atmospheric early warning system; operationalization of national observatory; integrated atmospheric and space observation such as radar, aircraft and satellite; integrated data assimilation system and atmospheric and space prediction.
 - Medium Term (2030): Strengthening DSS coupling outer space-atmosphere; the integration of extreme outer space and atmosphere observation of the Indonesian Maritime Continent within the framework of international data; Internationally recognized

national observatory; integrated and standardized data assimilation and prediction system of outer space and atmosphere.

- Long Term (2040): Integrated and standardized DSS based on space and atmospheric science and become benchmark/reference for national development; active participation on space-based international activities.
- b. Remote Sensing
- Short Term (2020): The operations of the Data Bank on National Remote Sensing (Bank Data Penginderaan Jauh Nasional/BDPJN) supported by a spatial data network system based on remote sensing satellite.
 - Medium Term (2030): The availability of data processing infrastructure for local governments; the availability of high resolution of multispectral and hyper-spectral data acquisition system based on air platform (UAV); the operation of national remote sensing satellites.
 - Long Term (2040): The operations of a national constellation of remote sensing satellites; the promotion of national independence for the operations and development of national remote sensing satellites and their utilization.
- c. Mastery of Space Technology
- Rockets
 - Short Term (2020): The finalization of third-stage rocket prototype with a diameter of 550 mm; the finalization of development plan and testing of low altitude-high subsonic guided rocket; launching trial of liquid non-cryogenic engine of 2000 kgf (kilogram force) class; substantial increase in production and testing

- facilities of components, including subsystems of the Brazilian-born Sonda rocket system.
- Medium Term (2030): The operations of the Sonda rocket system to the altitude of 300 km; the realization of development plan of rocket technology to orbit LEO micro satellites.
 - Long Term (2040): The realization of rockets with the capabilities of launching and orbiting micro satellites to LEO.
- Satellites
 - Short Term (2020): The operations, utilization and data services of LAPAN-A4 satellite; the launching and initial operations of (LEOP/IOT) LAPAN-A5 satellite; the development of satellite AIT facilities and support systems for the engineering model (EM) of LAPAN B1 satellite; the finalization of the National Satellite-Based Augmentation System (SBAS) document; continuity of technical assistance for university microsatellites.
 - Medium Term (2030): The mastery of technology and applications of optical Earth observation satellites; the operations of Earth observation and communication satellites; promoting the capabilities of national satellite AIT; the development, operations and utilization of equatorial orbit or near equatorial orbit (NEqO) SAR satellites.
 - Long Term (2040): The operations of Earth observation, telecommunication and navigation satellites; mastery and independence in the planning, development, testing and operations of Earth observation satellites for different missions.

- d. Launch
 - Short Term (2020): The finalization of the planning document on the development of spaceports.
 - Medium Term (2030): The operations of spaceports; spaceport development for wider/bigger diameter rocket; the availability of spaceport operational standards.
 - Long Term (2040): The operations of spaceports with the capabilities to launch wide diameter rocket.
- e. Commercial Space Activities
 - Short Term (2020): The availability of certified services industry for remote sensing data processing and analysis; the operation of Short Take Off and Landing (STOL) air transportation by the national industry.
 - Medium Term (2030): The ability to provide remote sensing satellite services to meet national needs; the ability to provide services on unmanned aircraft to meet national needs; the ability to provide relevant services related to the development of aeronautical technology.
 - Long Term (2040): The ability to provide launching services both to domestic as well as foreign satellites to orbits in LEO from launching stations and spaceports within the Indonesian territory.

11. Space Policy Coordination and Forum

Coordination among different ministerial and non-ministerial institutions is very important to achieve national development and to meet the targets as formulated in the Indonesian Space Master Plan 2016–2020. In Indonesia, space-related activities involve among others: Ministry of Research and Technology/ National Innovation and Research Institute; LAPAN; Ministry of Defense; Ministry of Foreign Affairs; Ministry of Transportation; Ministry of Communication and Information; Ministry of

National Development Plan/National Agency on Planning of National Development. In the past, when DEPANRI still existed, the coordination mechanism on aviation and space-related activities were relatively well run as shown by the results of two (2) special sessions of DEPANRI meetings led by the President. The first was held in 1994, while the second was in 1998.

The first session was held with the objectives of discussing certain issues in the field of aviation and space, which were directly related to the national interests and to stipulate the national program in the field of aviation and space for the 2nd Long Term Development Plan (PJP). The results of the first session of DEPANRI were:

- a. To develop and formulate guidelines for designing aerospace policy and national aerospace development plan, including elaborations of rules and norms in the form of legal products;
- b. To develop and promote aerospace manufacturing and service industry;
- c. To conduct scientific research and development;
- d. To promote quality human resources in the utilization, development and mastery of aerospace science and technology;
- e. To develop relevant laws and regulations to encourage national aerospace efforts and securing its achievements, and to support the defense of national interests in international forums, especially regarding the international recognition of the rights to exercise national sovereignty in airspace, and to serve the national interests in outer space in a comprehensive way.

Another important result of the first session of DEPANRI meeting was the decision that in peace situation 80% of the activities should be civil (including commercial) and 20% for military/defense, while in war situation all resource shall be mobilized for military/defense purposes.

The second special session of DEPANRI was held in 1998. The objectives of the meeting were to discuss and determine policy, priority and targets for aerospace development in order to make progress and achieve independence in aerospace field to contribute to national development. The significance of the meeting was as a legitimacy of the results of the 1st National Aerospace Congress held in the same year.

Another important forum for aerospace policy was the National Aerospace Congress. The 1st National Aerospace Congress was held in 1998. All stakeholders of aerospace activities attended the congress. Participants of the congress were not only from governmental agencies but also academia, researchers, experts, private entities, and individuals. Some fundamental and important issues were agreed by the congress, among others:

1. National Aerospace Concept as an elaboration of perception and attitude of the Nation in dealing with the utilization of aerospace as manifestation of national interest in aerospace;
2. General Policy for the 2nd Long Term Development Plan;
3. The amended national position on the matter of geostationary orbit, in line with the dynamic development of the issues;
4. Law reform, especially in national space legislation program by ratifying relevant international legal instruments for space activities, enactment of national space act and determination of national position in definition/delimitation of outer space;
5. Policy on international cooperation.

The Second National Aerospace Congress was held on 22–24 December 2003. During the Congress, ten strategic issues were discussed, covering: human resources development; enforcing national sovereignty over the airspace; mastery of aerospace technology; aerospace industry; the management of national airspace; air transportation safety and security; flight information

region (FIR); frequencies for telecommunication; definition and/or delimitation of outer space and national aerospace concept.

Currently, most of the decisions and recommendations that have resulted from both DEPANRI meetings and National Aerospace Congresses have been well implemented. Some examples of such implementation are the ratifications of 4 among 5 space treaties; the formulation of an Indonesian Space Act in the form of Law no. 21 of 2013 on Space Activities; the position of Indonesia concerning Definition/Delimitation of Outer Space have been communicated during the Legal Sub Committee Session of UNCOPUOS in 2016; the Indonesian proposal for elaborating a *sui generis* regime concerning the utilization of geostationary orbits at Legal Sub Committee of UNCOPUOS.

The dissolution of DEPANRI by Presidential Decree no. 176 of 2014 raised the issue of what would be the coordination forum and mechanisms for coordination in aerospace policy and implementation under the current regime. When DEPANRI still existed, its secretariat was done by LAPAN. During the current vacancy, can this function still be implemented by LAPAN by referring to Law no. 21 of 2013 and in particular to Presidential Regulation no. 49 of 2015 concerning LAPAN? Presidential Regulation no. 49 of 2015 concerning LAPAN states, among others:

1. LAPAN is a non-ministerial institution under and responsible to the President through the Minister in charge of governmental research and technology affairs [Article 1, para 1];
2. The main tasks of LAPAN are to manage government tasks in the field of aerospace research and development and its utilization, and the management and implementation of space activities in line with relevant laws and regulations [Article 2];
3. In conducting its tasks as formulated in article 2, LAPAN shall [Article 3]:

- a. formulate national space policy in the field of research and development of space and atmospheric science, aerospace technology, remote sensing and its utilization;
- b. conduct research and development on space and atmospheric science, aerospace technology, remote sensing and its utilization;
- c. conduct space activities;
- d. conduct functional activities in implementing its task;
- e. Etc.

V. INTERNATIONAL COOPERATION POLICY

In conducting space activities, in particular to meet/accommodate national interests, international cooperation is a fundamental requirement. Law no. 21 of 2013 on Space Activities specifically have some provisions on international cooperation. Indonesia is basically open for any kind of international cooperation, both with other states, international organizations, and institutions in line with relevant laws and regulations [Article 73, para (1)].

Such international cooperation can be in the forms of mastering space technology, utilization of technology, transfer of knowledge, transfer of technology, and human resource capacity building [Article 73, para (2)]. It is further stated that the Government shall be actively involved as member of space-related international organizations to promote international cooperation [Article 74, para (1)]. The participation of Indonesia in such organizations shall be in line with relevant laws and regulations [Article 74, para (2)].

International cooperation shall be directed towards the transfer of technology or knowledge and to encourage independence in conducting space activities [Article 75, para (1)]. To achieve the objectives of international cooperation, the Government shall, in every international cooperation [Article 75, para (2)]:

1. Provide training and internship opportunities for relevant technical staffs;

2. Promote and conduct good relations with research centers, both from governmental as well as private research institutions;
3. Engage in public–private partnership;
4. Promote capacity building development for research; human resource capacity building in space application and management; institutional capacity building for research and development; implementation programs for research for needed technology; and long-term partnership between the owner of the technology and local potential user.

Indonesia so far has been very active in conducting international cooperation, both bilaterally, regionally as well as globally.

Indonesia has bilateral cooperation programs with numerous countries such as Japan, the People’s Republic of China, India³⁹⁴, Germany³⁹⁵, USA³⁹⁶, France³⁹⁷, Russia³⁹⁸, etc. The scope of international cooperation programs includes education; space and atmospheric science; satellite research and development; rocket development and launching; development and operation of spaceports; telemetry, tracking and commanding; intermediate air launch transportation system; procurement and launching of satellites; commercial space activities; etc.

Regionally, the level of cooperation under the ASEAN has been growing in line with the dynamic development of the ASEAN Community and its three pillars, the ASEAN Economic Community (AEC), the ASEAN Security Community (ASC), and the ASEAN Social and Cultural Community (ASCC). There are even some ideas to set up an ASEAN Space Organization [17–20].

³⁹⁴ The cooperation between Indonesia and India, in particular the Indian Space Research Organization (ISRO), is for the launch of LAPAN-A series of microsattellites to low Earth orbit.

³⁹⁵ LAPAN-TUB Sat was developed in cooperation with the Technical University of Berlin in Germany.

³⁹⁶ Since 1976, Indonesia has extensive cooperation with the United States for the procurement and launching of satellites, for remote sensing, etc.

³⁹⁷ Some of Indonesian satellites were launched by French company Arianespace from French Guyana

³⁹⁸ In 2006, Indonesia and Russia had intensive negotiations on the possibility to use the Biak Airfield in Papua as Intermediate Airfield for Air Launch Space Transportation System. Indonesia and Russia also signed a government-to-government space cooperation agreement signed by the two Presidents on 1 December 2006.

Indonesia is also one of the signatories on the Convention on Establishing the Asia–Pacific Space Cooperation Organization (APSCO) although still in the process of ratifying it. Some Indonesian scholars have been invited to attend APSCO conferences and trainings, and to get some benefits from its cooperation scheme.

As a member of the Japan-led Asia–Pacific Regional Space Agency Forum (APRSAF), Indonesia actively attended its annual gathering and discussed some important issues, such as: space applications, space safety, etc.

At the global arena, Indonesia has been very active in attending and contributing to the sessions of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), both at the sessions of Scientific and Technical Sub Committee, Legal Sub Committee as well as its Parent Committee.

VI. THE WAY FORWARD

- A. With a specific geographical and demographical situation, Indonesia has strong interests and dependency on space science and technology and its applications to accommodate its national interests and the needs of its national development.
- B. In the efforts to accommodate its national interests and development, Indonesia has initiated national space programs in many fields such as: space and atmospheric science; remote sensing; mastery of space technology like satellites and rockets; launching; and commercialization of space activities.
- C. Some achievements resulted from Indonesian space activities although the road toward their independence and sustainability requires further developments.
- D. Some policies and regulatory framework are in place to support further developments of Indonesian space activities, including the Master Plan for Space Activities 2016–2040. Targets have been set up but need an effective coordination mechanism.

- E. In line with the characteristics of space science and technology and its applications, Indonesia needs international cooperation in relevant space activities. Such cooperation initiatives are made at bilateral, regional and global levels and cover both inter-governmental level as well as international organizations and the private sector.

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**LEGAL AND REGULATORY FRAMEWORK
OF LONG-TERM SUSTAINABILITY OF
OUTER SPACE ACTIVITIES (LTSOSA),
SPACE SECURITY AND ITS CONTRIBUTION
TOWARDS HUMAN SECURITY³⁹⁹**

ABSTRACT

Long Term Sustainability of Outer Space Activities (LTSOSA) was adopted during the UNCOPUOS Session in June 2019. It consists of 21 guidelines in four (4) categories, namely: policy and regulatory framework of outer space activities; safety of outer space operations; international cooperation, capacity building and awareness; and technical research and development. The LTSOSA is in line with the definition of Space Security which relates to guaranteed access to Space and the ability to freely exploit space for various purposes. Space Security cover both: safety, sustainability and the security of the space system and actors. While Human Security is an approach to assist Member States in identifying and addressing widespread and cross-cutting challenges to the survival, livelihood and dignity of their people. It calls for people-centered, comprehensive, context-specific and prevention-oriented responses that strengthen the protection and empowerment of all people. This article will be focused on analyzing and

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elaborating three (3) main issues: The correlation among LTSOSA, Space Security and Human Security; The Contributions of LTSOSA and Space Security toward the achievement of Human Security's Objectives; and Legal and Regulatory Framework of LTSOSA, Space Security and Human Security.

KEYWORDS:

Legal and Regulatory Framework, Long Term Sustainability of Outer Space Activities (LTSOSA), Space Security, Contribution, Human Security

INTRODUCTION

The development and formulation of LTSOSA was initiated by the Scientific and Technical Sub-Committee of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS). In 2110 it was developed based on prevailing best practices. In 2014 Session of Technical and Scientific Sub Committee of UNCOPUOS, 31 points of the draft Guidelines was presented and discussed. In 2016 the discussion on 12 Guidelines was finalized, followed by second set of 9 Guidelines was also finalized in 2018. The 21 Guidelines was formally agreed and adopted by UNCOPUOS Plenary Session in 2019 (Yan, 2019).

As a concept LTSOSA is the ability to maintain the conduct of space activities indefinitely into the future in a manner that realizes the objective of equitable access to the benefits of the exploration and use of outer space for peaceful purposes, in order to meet the need of the present Generations while preserving the outer space for future Generation (Permatasari, 2019; Budisulistiorini et al, 2018).

The LTSOSA consist of 21 guidelines which comprise of a collection of internationally recognized measures for ensuring the LTSOSA and enhancing the safety of space operation. The Guidelines address the policy, regulatory, operational, safety, scientific, technical, international cooperation, and capacity building aspect of space activities. They are based on substantial body of knowledge, as well as experience of States, International Inter-Governmental Organizations and relevant national and international non-governmental entities. The Guidelines also relevant to all space actors and space activities,

whether planned or on-going, as practicable, and to all phases of a space mission, including launch, operation, and end-of life disposal (Nasution & Zahra, 2017; Bejarano et al, 2019)

The purpose of the Guidelines is to assist States and Intergovernmental organization, both individually and collectively, to mitigate the risk associated with the conduct of outer space activities so that the present benefits can be sustained and future opportunities realized. Consequently, the implementation of the guidelines should promote international cooperation in the peaceful uses and exploration of outer space (Nastiti & Giyarsih 2019; Akhir et al, 2016).

The method for collecting data and information for this article is based on desk study from available sources, both primary, secondary and tertiary legal materials. The analysis is applying qualitative and normative approaches, in particular on the relevant issues regarding LTSOSA, Space Security and how it contributes to the attainment of Human Security's objectives

CONCEPTUAL BACKGROUND AND HUMAN SECURITY

The concept of Human Security was introduced in the UNDP's 1994 Human Development Report, entitled "New Dimension of Human Security". The Report introduced a new concept of Human Security, which equates security with people rather than territories, and with development rather than arms.

The 1994 Report stressed that Human Security is people-centered, and "is concerned with how people live and breathe in society, how freely they exercise their many choices, how much access they have to market and social opportunities and whether they live in conflict or in peace". The concept revolves around the importance of affording people "freedom from fear" and "freedom from want"

UNGA Resolution no 66/290 of 2012 was an important milestone as it described Human Security as "the right of people to live in freedom and dignity, free from poverty and despair". In 2018 the UN Secretary General said that "Human Security, National Security and Global Security are indivisible. When people fear for their lives, their communities, societies and countries are at increased risk. When people enjoy safety, so do their countries and the World". Human Security links to human development approach which is about expanding the richness of human life, rather than simply the richness

of the economy in which human beings live are clear: one cannot exist without the other.

There are some initiatives relevant to Human Security, such as:

- i. Global Initiative on Human Security: people's protection and empowerment.
- ii. The Security System Reform Agenda: linking Security, Development and Governance.
- iii. Initiatives led by Government and Other International Networks.
- iv. Civil Society: a critical partner for the State to enhance Human Security.

There are some other relevant initiatives to Human Security: 2030 Agenda for Sustainable Development; The New York Declaration for Refugees and Migrants; The Sendai Framework Disaster Risk Reduction; The Sustaining Peace Agenda. As with human development approach, the concept of Human Security is closely related to the 2030 Agenda. Human Security's People-Centered approach is essential to realize the core ambition of the 2030 Agenda- that is to have no-one behind.

The concept of Human Security ensured a better Agenda 2030 than would otherwise have been possible to negotiate. Both the SDG and Human Security recognize that development challenges are complex and interlinked and that, an integrated, multidimensional approach to development is needed. The humanitarian development-peace nexus also sits at the core of the notion of Human Security. Essentially it is a recognition of the fact that sustainable development and sustaining peace are two sides of the same coin.

The 2030 Agenda emphasizes a very basic human needs such as a world free from poverty, hunger, disease as well as access to safe drinking water and food. SDG no 16 is one of the key SDG's to promote Human Security. It sets us the goal to promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all level.

LTSOSA AND HUMAN SECURITY

One of the main concerns of LTSOSA is sustainability of outer space activities both for Present and Future Generations. Such sustainability cover both to space environment, safety and operations, international cooperation, capacity building as well as scientific and technical research.

Human Security puts it emphasize over people security which are free from fear, free from want, free from poverty and free from despair. LTSOSA through the application of space science and technology and its application would be able to support the achievement of Human Security's Goal and Sustainability Development Goals.

SPACE SECURITY AND HUMAN SECURITY

As Space Security developed from its conservative concepts of security to its expanding concepts covering safety, sustainability and security of space system and actors, it is in line with the developing concept of Human Security, from narrow and conservative meaning of security to expand from territorial security to people security and from arms to development. The expansion of the concept of security, both Space Security as well as Human Security would enable that space security can also be dedicated to the achievement of Human Security.

HUMAN SECURITY AND SDG

As with human development approach, the concept of Human Security is closely related to SDG's 2030 Agenda. Human Security's people-centered approach is essential tools to realize the core ambition of SDG's 2030 Agenda- that is to Leave No-One Behind. Both SDG's 2030 and Human Security recognize that development challenges are complex and interlink and that, an integrated, multidimensional approach to development is needed.

CONTRIBUTION OF LTSOSA AND SPACE SECURITY TO THE ATTAINMENT OF HUMAN SECURITY'S OBJECTIVES

Space Contribution to SDG and Human Security

- i. Contribution to SDG no 4 on Quality Education: provide precious hands-on opportunities for students in university;
- ii. Contribution to SDG no 9 on Industry, Innovation and Infrastructure: offer opportunity for Developing Countries to develop space technology domestically and build basic elements for a potential space industry and inspire innovations in the country;
- iii. Contribution to SDG no 10 on Reducing Inequalities: reduce the “space gap” between space-faring nation. Countries benefitting the program become space-faring countries;
- iv. Contribution to SDG no 16 on Peace, Justice and Strong Institutions: Cooperation in outer space is of great importance for world peace. Ensure the compliance of international space law and play an important role in supporting new-space-faring nations to develop national space law;
- v. Contribution to SDG no 17 on Partnership for The Goal: triangular cooperation (Japan- Kenya-Italy-UNOOSA), South- South Cooperation, Technology transfer.

LTSOSA, SPACE SECURITY AND ITS CONTRIBUTION TO HUMAN SECURITY

The Objective of Human Security: to create political, economic, social, cultural and environmental conditions in which people live knowing that their vital rights and freedom are secure; to keep critical pervasive threats from invading the vital core of human lives. Another version of Human Security’s Objectives is formulated as “To Safeguard of the Vital Core of All Human Lives from Critical and Pervasive Threat, in a way that is consistent with-long term Human Fulfillment”. On the interpretation on some keywords on such definitions are as follows: Safeguard means human security is deliberately protective; Vital Core means human security is contained in scope; All Human Lives means human security is “people-centered”; Critical and Pervasive Threat means the focus of human security is squarely on human lives; and Human Fulfillment means human security focuses on a limited core of individual activities and abilities, on a minimal subset of human development and human rights. LTSOSA through

the implementation of its 21 Guidelines and Space Security through its range of activities may potentially be contributed to the achievement of Human Security's Objectives.

LEGAL AND REGULATORY FRAMEWORK TO SUPPORT THE CONTRIBUTION OF LTSOSA AND SPACE SECURITY TO HUMAN SECURITY

Legal and Regulatory Framework of LTSOSA

- i. Guidelines for the LTSOSA as adopted by the Plenary Meeting of the UNCOPUOS in June, 2019.
- ii. This Guidelines touch on a range of activities aimed at enhancing sustainability of space environment, safety of space operations, international cooperation, capacity building, and scientific and technical research.
- iii. It is voluntary, but the Guidelines do become legally binding as States adopt the recommended measures through national legislation and regulation.
- iv. The Guidelines represent the most significant international agreement to advance the governance of State Security in decades.
- v. The Guidelines make a critical link between the three (3) pillars of Space Security: safety, sustainability, and the security of space systems and actors.

Legal and Regulatory Framework of Space Security

- i. UNGA Resolution no 75/36 on Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviors. By UNGA Resolution 75/36, the General Assembly encouraged Member States to study existing and potential threats and security risks to space system, including those arising from actions, activities or systems in outer space or on Earth, characterize actions and activities that could be considered responsible, irresponsible, or threatening and their potential impact on international security, and share their ideas on the further development and implementation of norms, rules and principles of responsible

- behaviors and on the reduction of the risks and misunderstanding and miscalculations with respect to outer space.
- ii. Draft International Code of Conduct for Outer Space Activities of 2014: This draft in the form of proposed Soft Laws contain some provisions on Space Security, covering: purpose and scope; general principles; promotion with and promotion of Treaties, Conventions and other commitment relating to outer space activities; measures on outer space operation and space debris mitigation; notification of outer space activities; information of outer space activities; consultation mechanism; meeting of subscribing States; central point of contact; and participation by regional integration organization and international intergovernmental organization.
 - iii. Prevention of Arms Race in Outer Space (PAROS): PAROS divided into two (2) parts: Part I on Military Space Activities and Their Legal Limitation; Part II on Prevention of Arms Race in Outer Space. Part I consist of Chapter 1 on the need for security in outer space covering issues related to the prevention of arms race in outer space and linkages between bilateral USSR/US initiatives and multilateral initiatives. Part II cover some international agreements containing provisions applicable to arms limitation and prohibition in outer space and general provisions concerning activities in outer space.

UNGA Resolution on General and Complete Disarmament: Transparency and Confidence Building Measures in Outer Space Activities:

This resolution reaffirms the right of all countries to explore and use of outer space in accordance with International Law. It also reaffirms that preventing an arms race in outer space is in the interest of maintaining international peace and security and is a essential condition for the promotion and strengthening international cooperation in the exploration and use of outer space for peaceful purposes. It encourages Member States to continue to review and implement, to the greatest extent practicable, the proposes transparency and confidence building measures through the relevant national mechanism, on a voluntary basis and in a manner consistent with the national interests of Member States.

LEGAL AND REGULATORY FRAMEWORK OF HUMAN SECURITY

UNGA Resolution no 66/290 of 2012 on Follow-Up to Paragraph 143 on Human Security of the 2005 World Summit Outcome: The Resolution recognize that development, human rights and peace and security, which are the three pillars of the United Nations, are interlink and mutually reinforcing. It agreed on the common understanding that the notion of human security includes the following:

- i. The right of people to live in freedom and dignity, free from poverty and despair;
- ii. Human security call for people-centered, comprehensive, context-specific and prevention-oriented responses that strengthen the protection and empowerment of all people and all communities;
- iii. Human security recognizes the interlinkages between peace, development and human rights, and equally considers civil, political, economic, social and cultural rights;
- iv. The notion of human security is distinct from the responsibility to protect and its implementation;
- v. Human security does not entail the threat or the use of force or coercive measures;
- vi. Human security is based on national ownership;
- vii. Government retains the primary role and responsibility for ensuring the survival, livelihood and dignity of their citizens;
- viii. Human security must be implemented with full respect for the purposes and principles enshrined in the Charter of the United Nations.

UN TRUST FUND FOR HUMAN SECURITY (UNTFHS)

UNTFHS finance programs that translate the human security approach into practical actions and provide concrete and sustainable benefits to vulnerable people and communities threatened in their survival, livelihood and dignity.

UNTFHS finances activities carried out by UN organizations to demonstrate the added value of the human security approach and extend its usage and awareness both within and outside of the United Nations System.

THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT

The 2030 Agenda and its 17 Sustainable Development Goals (SDGs) is universal, transformative and right-based. It is an ambitious plan of action for countries, UN Systems, and all other actors. The agenda is the most comprehensive blueprint for eliminating extreme poverty, reducing inequality, and protecting the planet.

The 2030 Agenda contain the following core principles, namely: universality; leaving no one behind; interconnectedness and indivisibility; inclusiveness; and multi-stakeholders' partnerships.¹⁷ SDGs are not a summary of the agenda, but rather focus areas necessary to achieve sustainable development. The 17 goals should be seen as indispensable pieces in a big and complex puzzle. The SDGs help translate the core values and principles underlying the 2030 Agenda into concrete and measurable results.

THE NEW YORK DECLARATION FOR REFUGEES AND MIGRANTS

On September 19 of 2016 the UNGA adopted the New York Declaration for Refugees and Migrants. It has paved the way for the adoption of two new global compact in 2018: a global compact on refugees and a global compact for safe, orderly and regular migration. The New York Declaration sets out the key elements of a Comprehensive Refugee Response Framework (CRRF) and the global compact on refugees. It also provides for the negotiation of a global, compact for safe, orderly and regular migration. The tow processes leading to the two global compacts are to be "separate, distinct and independent".

THE SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION

The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) provide Member States with concrete actions to protect development gains from the risk of disaster. It was endorsed by the UN General Assembly

following the 2015 Third UN World Conference on Disaster Risk Reduction (WCDRR), and advocates for: the substantial reduction of disaster risk and losses in live, livelihoods and health and in the economic, physical, social cultural and environmental assets of persons, businesses, communities and countries.

THE SUSTAINING PEACE AGENDA

The key messages of the UN Sustaining Peace Agenda are: preventing conflict and achieving lasting peace as enshrined in the UN Charter is a fundamental responsibility of the UN's Member States; The UN System's agencies, funds and programs and Secretariat can play a catalytic role in sustaining peace but they need greater political, financial and operational support from Member States; Member States should support the UN to deliver the sustaining peace agenda in four (4) critical areas; above all, member countries must take the necessary diplomatic action to stop crises from escalating, bring parties back from the brink of violence and set them on the path to peace.

CONCLUSION

The developing concepts of LTSOSA, Space Security and Human Security are closely correlated which are emphasized to protecting and empowering people, for development, and dedicated both for Present and Future Generations. The achievement in space science and technology and its applications in the framework of LTSOSA and Space Security are potentially be contributed to the achievement of Human Security's Objectives. The Legal and Regulatory Framework of LTSOSA, Space Security and Human Security, both in the forms of hard laws, soft laws and other draft instruments are relevant and complementary to be used as guidance and reference to the achievement of Human Security's Objectives.

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SPACE LAW DEVELOPMENT IN RETRO AND PROSPECT

In more than six (6) decades of human venture in outer space, space science and technology and its applications have made tremendous progress. Outer space is currently not only dedicated to show superiority in military and public sectors, but has extended into civil and commercial activities. In line with such development, some more legal issues arise.

This book provides the thoughts, ideas and contributions of the writer to deal with various legal issues related to outer space activities, both past, present and future. It consists of articles, book chapters and presentations in different occasions. Various different legal issues are covered, among others: space contributions to disaster management; interpretation and implementation of international space treaties and resolutions; commercialization of space activities; national space legislation and challenges for implementation; developing countries contributions to future development of outer space; space financing; space policies and institutions; long term sustainability of outer space activities; access of developing countries to outer space activities; equitable access to orbit-spectrum resources; national space policies and programs.



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