

The Post-human Era: A Time to Reduce Barriers to Intra-Professional Dialogue & Apply More Effective Policy Response

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*For every evil under the sun, there is a remedy or there is none.
If there be one, try to find it. If there be none, then never mind it.*

- Mother Goose Nursery Rhyme

The *Post-human era* is a time when scientific advances cause us to rethink national and global priorities. Emerging technology and socio-cultural crises challenge democratic systems, views of freedom, the sovereignty of individuals and nations. It's also time to review the value of legal regimes, barriers, intra-professional dialogue and cooperation.

Using six case examples, this paper analyzes the changing notion of success and failure in the emergence, expansion, and enforcement of international space law. Space law relates to six urgent, intractable global problems, but falls short of compelling accountability and definitive action to rethink and resolve jurisdiction and control issues. It refers to international institutions and political processes created by select, developed countries¹ by which international norms are established and enforced by the U.N., supported by human rights conventions and other treaties.

¹ States which have national law and legislation governing space-related activities include inter alia Argentina, Australia, Canada, Finland, France, Germany, Hungary, Indonesia, Japan, New Zealand, Philippines, Republic of Korea, Russian Federation, Slovakia, Sweden, South Africa, Tunisia, Ukraine, the U.K. (Great Britain and Northern Ireland), and the USA. The U.N. Office for Outer Space Affairs is the Secretariat for the Legal Subcommittee of the U.N. Committee on the Peaceful Uses of Outer Space (COPUOS), the key international forum for the development of outer space laws and principles. In addition to providing parliamentary services, OOSA prepares legal studies and background documents on space law to assist member states.

Background

The paper is designed to explore why state governments cede sovereignty to international institutions, the primary purpose being to empower their own citizens, at times, aided by foreign states, to mobilize or litigate against them in international forums. To this end, the paper analyzes the politics of norm creation and expansion, inquiring about the relative importance of interstate coercion and cooperation (intervention), institutional systems (the national origin of international judges/officials, the form of international tribunals and standards), national commitment (interests), and more idealistic persuasion (NGOs, public opinion, trans-national media).

Arguably,² the need exists to broaden *interdisciplinary participation* in law-making. Technical advances contribute to complex, societal problems. Yet, they also enable leaders to recognize value in legal and non-legal expertise which enhance understanding of problems and more effective solutions. Trans-border crises prompt serious reflection about the nature and applicability of some legal regimes. International solutions to pressing global problems could be made more viable by input of diverse actors who reinforce citizenship rights and also apply humanistic principles of the original Outer Space Treaty (OST).³

² See the author's last four IAF- IISL papers.

³ See The Treaty on Principles Governing the Activities of States in the Exploration and Use of

Definitions

Human: the use of this term isn't shorthand for attributes humans possess; rather, it defines the nature of being. (The whole is more than sum of parts).⁴

Post-human era: defines present and future eras where nanotechnology, information technology, and genetic engineering alter human lives, extend the limits of Science, challenge applications of legal regimes, our ethics, thoughts.⁵

Interdisciplinary participation process: defines interaction among individuals from varied groups, societies and experiences. The likelihood of expanded participation occurring in policy and law-making is greater in a democracy.⁶

Background

On a general level, legal authorities traditionally draft legislation to apply in a fixed territory, based on established jurisdiction and control. All-the-while, science and technology advances continually expand boundaries of the possible.⁷ Developed societies often choose to regulate. Input from investors

Outer Space, including the Moon and Other Celestial Bodies, UNCOPUOS, 1967.

⁴ Webster's Seventh New Collegiate Dictionary, G & C. Merriam Co. 1963, p. 590

⁵*Converging Technologies for improving human performance: nanotechnology, biotechnology, information technology and cognitive science* nsf/doc-sponsored report, June 2002.

<http://www.wtec.org/ConvergingTechnologies/> (last consulted September 8, 2004); also Pres. Bush signed into law the 21st Century Nanotechnology Research and Development Act December 2, 2003.

⁶ See Schuck, Peter, *Limits of Law: Essays on Democratic Governance*, Westview press, 2000.

⁷ See Bruno, Leonard C. *Science & Technology Firsts*. Detroit: Gale Research, 1997.

and lobbyists in developed countries increasingly drives changes in views on and uses of national and international law, as well as in accepted customary practice. Scientists and other interest groups exert influence on the process, but they could be more politically-astute and more effectively shape policy outcomes and implementation.⁸

Space law can be described as the body of law applicable to and governing space-related activities. The term *space law* is most often linked to the rules, principles and standards of international law appearing in the five treaties and five sets of principles governing outer space which have been elaborated under the auspices of the U.N. Yet, space law also includes international agreements, treaties, conventions, rules and regulations of international organizations (e.g., ITU), national laws, rules and regulations, executive and administrative orders, and judicial decisions.

Space law governs activities such as launching and recovery of satellite equipment, and principles of engaging in space activities for the good of mankind. It implies the altruistic motivation to engage in international cooperation with regard to outer space and doesn't simply extend terrestrial laws into outer space.

Six Cases:

These six case examples illustrate contemporary and futuristic situations where space law applies, but can also be problematic. Space law was devised before the recognition of complex, trans-border problems which complicate defining jurisdiction and control issues. Sovereignty issues complicate defining practical solutions to pressing problems.

⁸ See The David Suzuki Foundation at www.davidsuzuki.org (consulted Sept 10, 2004).

Case # 1:

Problem: Stratospheric Ozone Layer

The way governments deal with contemporary environmental problems on Earth relates to the successes and failures of space law.⁹ For instance, the ozone layer is a naturally-occurring ozone gas 16-50km and higher up in the Earth's atmosphere.¹⁰ It's meant to absorb much of the harmful radiation arriving from the Sun and from space.¹¹ Certain chemicals, mainly CFCs, destroy high-level ozone. When high levels of harmful radiation reach the Earth's surface, health of inhabitants and ecosystems are adversely affected. Admittedly, use of technology in the *post-human* era can worsen ozone problems, but it also enables detection.

Initial detection of ozone depletion led to government lobbying. In 1978, CFC propellants in spray cans were banned in the U.S. In the 1980s, the Antarctic "ozone hole" was detected and an international science assessment more strongly linked the release of CFCs and ozone depletion. Stronger worldwide response was needed. The first international agreement to restrict CFCs came with the *Montreal Protocol*¹² in

1987.¹³ Excluding medical sprays, most CFCs have not been produced by any of the signatories since 1995.)¹⁴ As of 2004, 183 states had signed the Montreal Protocol.¹⁵ It is considered

¹³ Since signing, five revisions have been made: 1990, 1992, 1995, 1997, and 1999.

¹⁴ See "The Ozone Hole Tour," <http://www.atm.ch.cam.ac.uk/tour/part1.html#ozone> (last consulted September 16, 2004).

¹⁵ These are; Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, The Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burma, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, Chile, People's Republic of China, Colombia, Comoros, Democratic Republic of the Congo, Republic of the Congo, Costa Rica, Côte d'Ivoire, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, European Union, Fiji, Finland, France, Gabon, The Gambia, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guinea, Guyana, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, North Korea, South Korea, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Libya, Liechtenstein, Lithuania, Luxembourg, The Former Yugoslav Republic of Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Federated States of Micronesia, Moldova, Monaco, Mongolia, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Principality of Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syria, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, United Arab Emirates, U.K., United States, Uruguay,

⁹ See Covert L. & Gantt, J.B., "Autonomous Multilateral Teams and Their Impact on Custom and Practice: New Contributions to Public International Space Law," *Proceedings of the 44th Colloquium on the Law of Outer Space*, Toulouse, France, 2001, p.1-15.

¹⁰ See NASA Stratospheric Ozone Depletion tutorial <http://www.nas.nasa.gov/About/Education/Ozone/> (last consulted September 16, 2004).

¹¹ Consult NOAA/ National Weather Service National Centers for Environmental Prediction Climate Prediction Center, Stratosphere Data, <http://www.cpc.ncep.noaa.gov/products/stratosphere/> (last consulted September 17, 2004).

¹² <http://www.ciesin.org/TG/PI/POLICY/montpro.html> (consulted Sept 15, 2004)

more successful than the Kyoto Protocol¹⁶ which outlines more widespread requirements for changes in government and industrial practices.

Space law is relevant since the second-largest extinction in the Earth's history,¹⁷ the killing of two-thirds of all species, may have been caused by ultraviolet radiation from the sun after gamma rays destroyed the Earth's ozone layer.¹⁸ Where ecosystems are damaged in areas directly below ozone holes, the consequences of this damage is felt in global-warming and other trans-border effects that cause one to rethink value in international cooperation.¹⁹

As holes move in the Earth's atmosphere, the problem also spreads to varied nations, regardless of terrestrial sovereignty. This touches on the significance of sovereign airspace²⁰ and renders problematic some of the fundamental tenets of air and space law. The Convention on the Regulation of Aerial Navigation, signed in Paris on 13

Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe. (Note majority are not space-faring).

¹⁶ <http://unfccc.int/resource/convkp.html> (consulted September 16, 2004).

¹⁷ Cause of the largest extinction is widely considered to have been an asteroid collision

¹⁸ "Supernova, sun combo blamed for mass extinction," *CNN News*, Thurs., January 8, 2004, <http://www.cnn.com/2004/TECH/science/01/08/earth.extinction.ap/> (last consulted Sept. 08/04).

¹⁹ See Hammit James K. (Harvard University) and Adams, John (RAND), "The Value of International Cooperation for Abating Global Climate Change," resource and energy economics, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=4297#PaperDownload (consulted September 17, 2004).

²⁰ See Barrett, Dr. Raymond J., "Outer Space and Air Space, Difficulties in Definition," *Air University Review*, May-June 1973, electronic document created 29/12/03, <http://www.airpower.maxwell.af.mil/airchronicle/s/aureview/1973/May-Jun/barrett.html> (last consulted September 8, 2004).

October 1919, provided in Article I that ". . . every Power has complete and exclusive sovereignty over the air space above its territory." The basic agreement governing postwar civil aviation, the Convention on International Civil Aviation, signed at Chicago on 7 December 1944, reiterates the principle.

In direct contrast, claims of exclusive national sovereignty in outer space are prohibited by international agreements. The OST Article II provides that:

Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation or by any other means.

No nation has been willing to limit its air space to a specific altitude; to do so would define the upward extent of its sovereignty and, implicitly or explicitly, the lower limit of what it considered to be outer space. Economic issues cause many nations to focus on assigning or abdicating responsibility and liability, rather than seek to re-evaluate equality.

At least two views consider the need for a clear line between air space and outer space. One approach cites the need to delimit the legally-binding obligations regarding the activities and authority of nations in outer space and air space. Without a clear line, disputes will likely arise, as technology advances, regarding the extent and nature of the obligations nations have assumed in the international agreements related to outer space. Similarly, without consensual definitions among all states, a nation could assert claims of sovereignty that would interfere with space activities desired by many other countries.

The other approach argues that no evidence calls for a clear line and to pin one down now would be premature if not counterproductive. Supporters of this

view emphasize the rapid evolution of space technology in advanced countries and the practical uncertainties about the characteristics of feasible and desirable space activities. Yet, this view ignores repeated discussions acknowledging commercial development of space demands the formulation of new treaties²¹ and also the rethinking of sharing benefits.²² That these discussions also ignore the issue of whether or not a line should be drawn takes attention away from underlying global problems.

Case #2:

Problem: Man-Made Space Debris

Terrestrial environmental problems can also be more directly related to space law. For example, the issue of mobile space debris orbiting around the Earth brings our attention to the possible dangers it poses to all nations as well as to the fact that co-existence among unequal nations in international arenas brings reasons to re-think responsibility, risk, and global environmental defense.

Consider the space law success of the 1975 U.N. Convention on Registration of Objects Launched into Outer Space (Registration Convention) and other documents²³ that effectively recognize, among space-faring nations,

²¹ See Cheng, B., *Studies in International Space Law*, Oxford university, 1997, p.641.

²² See OST (1967) Art.I; Lafferranderie (various)

²³ For example, see the International Telecommunications Satellite Organization (ITSO) Treaty; Agreement relating to the international telecommunications satellite organization "INTELSAT" (with annexes and Operating Agreement) (1971); Convention on the international maritime satellite organization (INMARSAT) with Annex and Operating Agreement (1976); as amended 1985; with Protocol (1981); also Cheng, B., "Spacecraft, Satellites and Space Objects", in Bernhardt (ed.), *11 Ency. PIL* (1989).

the need to know how many man-made objects are launched into orbit around the Earth. The most recent UNCOPUOS meeting also furthered steps to clarify implications of the term "launching state."²⁴ Ongoing tracking in different countries monitors the activities of many of these objects, but less evident is how to clean-up or annihilate dead satellites.

Two major problems that exist include; (1) the prospect of larger objects falling out of orbit, and not entirely burning up in the atmosphere on their way to falling to Earth, and (2) the prospect of unforeseen navigational collisions involving space objects and possibly humans in space. From a legal view, the 1972 Convention on International Liability for Damage Caused by Space Objects (Liability Convention), illustrates successful consensus-building and acts as financial incentive for space-faring nations to devise new strategies to deal with potential falling debris. A key question to pose is, is such incentive enough to cause space-faring nations to consider the global picture more seriously?

Another issue to consider in the context of man-made space debris is the issue of information sharing.²⁵ Principles Relating to Remote-Sensing of the Earth from Outer Space (1972), define and consider different kinds of information-sharing and encourage cooperation, but national interests may also conflict with U.N. interests, rendering enforcement

²⁴ The practice of States and international organizations in registering space objects was a new agenda item discussed by the UNCOPUOS Legal Subcommittee during its 43rd, held in Vienna 29 March- 8 April 2004.

²⁵ See Smendziuk, Ritchie W., "The UN Principle of Non-discriminatory data access - does Radarsat make the grade?," Department of Space Studies Research paper, University of South Dakota, December 1996.

problematic. The Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (1972) also set forth useful guidelines with regard to satellites, but similar problems exist.

Case#3:

Problem: Genetic Space Research

Agricultural biotechnology research and applications cause modern controversy in developed and developing countries.²⁶ Legislating such research with unknown consequences is in flux.²⁷ The prospect of continued genetic research in space also prompts questions about applications of existing space law and the how space-faring countries value international cooperation and global crises.²⁸

Related successes in space law include the NASA Charter which provides the legal context and ability to engage in international cooperation. Bilateral and multilateral agreements evolved for programs like the Space Lab.²⁹ The International Space Station

(ISS) program motivated development of a series of agreements to expand existing space law to apply aboard a spacecraft. First, the governments involved in the ISS signed an international treaty on January 29, 1998, formalizing participation. The ISS IGA establishes, "a long term international co-operative framework on the basis of genuine partnership, for the detailed design, development, operation, and utilization of a permanently inhabited civil Space Station for peaceful purposes, in accordance with international law." (Article 1).

This treaty has been signed by the governments of the United States, Canada, Japan, the Russian Federation, and eleven Member States of the European Space Agency (Belgium, Denmark, France, Germany, Italy, The Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom of Great Britain and Northern Ireland). The IGA is the main legal document concerning the International Space Station. It creates a unique legislative regime, constituting a set of rules, which recognize and link the national jurisdiction of the Partner States on ISS.

National laws can therefore be applied to a given situation, in such areas as liability issues, the protection of intellectual property rights, the exchange of goods and data and even criminal matters.³⁰

It is unclear whether governments, that support genetically-modified food treaties on Earth, would also support contracted space lab researchers to create new life forms in microgravity,

²⁶ See International Treaty on Plant Genetic Resources for Food & Agriculture, International Seed Treaty, came into force June 2004, <http://www.ukabc.org/iu2.htm>; ICRISAT "To Harness Biotech for Poor," ; "Asian Development Bank and ICRISAT Launch Agricultural Development Initiative," ; Korean Crop Functional Genomics Centre and CropDesign Announce Collaboration," ; "Angolan GM Position Slows Aid Distribution," Biotech & Developing Countries, Sept. 2004.

²⁷ Note "GMO Import Ban Caught in Crossfire," where the US claims that a European ban on food containing GMOs is a breach of another set of international rules, the World Trade Organization's requirements for free trade *New Scientist*, September 2003.

²⁸ See Christol, C., *The International Law of Outer Space*, Pergamon, 1982.

²⁹ See International Agreements and other available legal documents relevant to space-

related activities, 1999, UNOOSA, www.oosa.unvienna.org/Reports/intlagree.pdf (last consulted September 17, 2004).

³⁰ See also Young, Andrew J., *Law and Policy in the Space Stations' Era*, Martinus Nijhoff Publishers, 1989; Galloway, E., "Law, Science and Technology," *Proc. 32nd Colloquium on the Law of Outer Space* 195 (1990).

like genetically- modified rice, and its propagation on Earth.³¹ This situation is worth noting because it makes a statement about state consistency, compliance and domestic interests.

A second level of agreements in the ISS legal framework involves the space agencies of participating governments. The governments who have signed the ISS IGA have delegated responsibilities to their respective space agencies to do the actual co-operative work of building, operating and utilizing the ISS. Five co-operating space agencies are involved, with the European Space Agency representing the European governments. The National Aeronautics and Space Administration (NASA) as the ISS coordinator, has signed bilateral agreements with each co-operating Agency (European Space Agency, Canadian Space Agency, Russian Space Agency, and Japanese Space Agency). Those four bilateral agreements, called Memoranda of Understanding (or "MoU"), describe in details the roles and responsibilities of the agencies in the design, development operation and utilization of the Space Station. In addition, those documents serve to establish the management structure and protocols necessary to ensure effectively the operation and utilization of the Space Station. The space agencies have also agreed to use, when necessary, *Bartering Arrangements*. Those bilateral agreements allow the exchange of Space Station resources between the Partners under certain conditions. Finally, the co-operative space agencies have created a third level of Space Station agreements. This level is constituted by bilateral Implementing Arrangements between

³¹ See Lobe, J., "Risks of Genetically-modified foods under global debate," *One World News*, February 23, 2004.

the space agencies, which have been created to implement the Memoranda of Understanding. They distribute concrete guidelines and tasks among the national agencies. Space research undertaken in microgravity environments is guided by agreements among researchers and owners of ISS laboratories.³²

This research can create new life forms and may lead to problems when the life form is propagated on Earth. Efforts to create diversity in plants, efforts to reduce disease, arguably already reduce the gene pool. Should humanity sacrifice long-term diversity for short-term pay-off? Consider 30-50 years in the future, a possible discovery that soil nutrients are depleted by new strain of space rice brought to Earth. This could effect life in developed and developing countries. Leaders don't often reflect on high order consequences (i.e., secondary, tertiary). Long-term risks may not appear tractable. Multidisciplinary teams would help define guidelines.³³

Case#4:

Problem: Clashing identities and civilizations & definitive ETI contact

Space law is definitely not a law governing, or intended to govern, our relations among humans and extraterrestrial beings, notwithstanding all the efforts being made to search for extraterrestrial life and to contact extraterrestrial intelligence.³⁴ The consequences of a definitive contact

³² <http://www.spaceflight.esa.int/users/file.cfm?filename=fac-iss-la-ssa> (consulted Sept 16, 2004).

³³ Frakes, J. Comment. "The common heritage of mankind principle and the Deep Seabed, Outer Space, and Antarctica: will developed and developing nations reach a compromise?," 21 *Wis. Int'l L.J.* 409-434 (2003).

³⁴ See Cheng, B., *supra*. Note 7, p. 1x.

with extra terrestrial intelligence (ETI) are as yet uncertain. Yet, interdisciplinary efforts have been made to outline and develop a process of related international cooperation.³⁵ The public reaction to this kind of event would likely be influenced by how it's detected, how information is shared,³⁶ and also how leaders may worry that such public knowledge would be destabilizing.³⁷

International efforts have however, proposed protocols for an international SETI reply to definitive contact. The SETI Protocol builds on existing space treaties and represents humanity's first attempt at galactic diplomacy. By resolution of the Board of Trustees on 17 August 1997, The SETI League, Inc. officially endorsed Protocols, and respectfully requested that their members embrace them. The SETI Committee of the International Academy of Astronautics supports these protocols, as do the Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence and the Draft Declaration of Principles Concerning Sending Communications with Extraterrestrial Intelligence (2000).³⁸ These agreements may be considered successes insofar as their development included the involvement of multidisciplinary groups of scientists and on-scientists. Yet, their true success would be tested in the event a definitive

ETI contact was made. Only then, would we know whether issues of jurisdiction and control would outweigh the value of international cooperation.

Case #5:

Problem: Space Piracy & Terrorism

Trans-border crises such as terrorism, drug trafficking, smuggling, and cyber-crimes pose challenges for traditional regulation and policy-making on Earth. Activism against root causes of these problems is often voiced by way of celebrities, politicians, and unverifiable information. Such campaigns mediatize trans-border problems and possible causes, like exploitation of developing countries, but they arguably reframe policy issues and harm the people activists claim to help.³⁹ Its assumed trans-border problems could be encountered in outer space where territorial sovereignty is relinquished. Existing space principles and treaties act as guides without effective enforcement.

Law enforcement has an important role in combating trans-border threats. That role suffers, however, from two fatal flaws. First, differences in bureaucratic culture and views between the law enforcement and national security communities make coordination difficult. Law enforcement agencies often refuse to see themselves as instruments of U.S. foreign policy. Traditional foreign policy establishments don't adequately appreciate distinct cultures, capabilities and constraints that characterize U.S. law enforcement agencies. Second, there are structural impediments to effective coordination, both among the various law enforcement

³⁵ Consider Planetary Society campaign for International Space Cooperation; also COSPAR.

³⁶ See "How Disinformation Experts Spread fear about UFOs," in *UFO Evidence*, Sept. 16, 2004 <http://www.ufoevidence.org/documents/doc1538.htm> (last consulted September 17, 2004).

³⁷ See Webre, Alfred Lambremont, JD, Med, God in "Exopolitics: A Decade of Contact," A Treatise. 2001.

³⁸ See SETI website, www.seti.org; also IAF Congress Report 2000, IAA Board of Trustees; UNCOPUOS Reports since UNISPACE III.

³⁹ See Mallaby, Sebastien, "NGOs: Fighting Poverty, Hurting the Poor," *Foreign Policy*, September 2004.

agencies and between such bodies and the traditional national security agencies. Federal law enforcement agencies, themselves driven by turf battles, lack proper civilian oversight and are often organizationally ill-suited for integration into the wider foreign policy community.⁴⁰

Case #6:

Problem: NEO Collision with Earth⁴¹

The ultimate trans-border disaster may be a Near Earth Object (NEO) collision. It would exacerbate pressing trans-border crises affecting human health, the environment and socio-political relationships among civilizations. An NEO collision could have devastating repercussions for the planet. This albeit hypothetical incident has the potential to redistribute poverty, public health problems and the ability to effectively satisfy basic human needs in developing and developed countries. The low probability, high risk scenario causes many people in government, industry and the general public to dangerously underestimate the potential devastation and repercussions.⁴²

The complexity of this possible situation compared to smaller scale disaster planning and response deserves further study in policy and law.⁴³ It

⁴⁰ See Wechsler, William, "Law in Order: Restructuring U.S. National Security," from *The National Interest Magazine*, Spring 2002.

⁴¹ Provost, René, chapter 20, "International Criminal Environmental Law," in *The Reality of International Law: Essays in honour of Ian Brownlie*, Book by Ian Brownlie, Guy S. Goodwin-Gill, Stefan Talmon; Oxford, 1999

⁴² Posner, Richard A., *Catastrophe: Risk and Response*, Oxford University Press, Nov. 2004.

⁴³ See E. Seamone, "The Duty to Expect the Unexpected: mitigating extreme natural threats to the global commons such as asteroid and

stands to reason that communication and coordination need to be reviewed and improved among agencies, governments and entities on regional, national and global levels.⁴⁴

Notably, the World Federation of Scientists has established a permanent monitoring panel where members focus on examining and better defining, "defense against cosmic objects."⁴⁵ One of the projects of this group is to build on the existing international scientific research and lobbying efforts to draft a treaty concerning asteroid deflection.⁴⁶ These scientists desire government policy makers to become more interested and proactive in impact hazard defense, so more organization is in place before a real collision is correctly predicted.

A prime example of interest is the situation that ensued in 14 countries after an unprecedented Asian tsunami on December 26, 2004. The very real damage from a large scale disaster was felt by many countries. Issues of rebuilding infrastructure and assisting people rebuild lives became priorities. Nations with knowledge and power to help here may be the next ones hit by

comet impacts with the Earth. 41 *Colum. J. Transnat'l L.* 735-794 (2003)."

⁴⁴ See Covert, L., "Before Celestial Bodies Collide: Enhanced Dialogue as a Precursor to a Treaty for Near Earth Object (NEO) Response," *Proceedings of Colloquium of the Laws of Outer Space*, Bremen, Germany, 2004, 11pgs; see also Report of the UK Near Earth Object Task Force (2000), UK Government Response to Near Earth Object Task Force (2001), Debate in the House of Lords (2001).

⁴⁵ See <http://www.federationofscientists.org/PMPanels/CosmicObs.asp>

⁴⁶ See Schweikart, R., "The Need for a United Nations Asteroid Deflection Treaty to Establish a System for Trustworthy Mission Design and Execution," B612 Foundation, January 8, 2003, p. 1-7; also www.b612foundation.org

disasters. Cooperation will be essential to deal with any asteroid collision.

Conclusion

Technology advances at an alarming rate. The post-human era is upon us. Present-day society and widespread mindsets are reactive. Policy doesn't keep up with issues at hand. This disparity fosters societal tensions, serves to widen knowledge gaps between societies and civilizations. When technological advance introduces higher order consequences, both perceived and real gaps between the "have" and "have not" countries are also expanding.

Amidst such tensions, are the threats of terrorism and trans-border disasters. Hope for addressing these tensions may be to use and share technology as a

means of democratizing political and legislative processes to involve persons from all walks of life. If, as the result, leaders were inspired to be less territorial in visions, law-making and action, and they were willing to work together to more effectively predict and mitigate future problems, while also cooperating more effectively to manage current problems, the world could be a much safer place.

After beginning by quoting a familiar nursery rhyme, this paper ends with a key phrase that is sadly often derided, "think globally, act locally." This is appropriate point of departure to leave readers to reflect on the modern interpretations and practical uses of international law in the art of persuasion.

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