### 1NC – CP

#### Counterplan: Private entities in Asia ought to invest in Large Satellite Constellations in Lower Earth Orbit for the purposes of emergency communications in the event of disaster relief or external shocks.

#### All other private entities except for those in Asia for that purpose ought not appropriate outer space.

#### Private LEO constellations are economically viable in the long term, but require upfront investment – those uniquely solve disaster response because of satellite internet’s connectivity options for island countries

Garrity and Husar 21 Garrity, John, and Arndt Husar. John Garrity is an economist, policy advisor, and project manager focusing on digital inclusion, universal internet access policy, and last-mile connectivity. He has coauthored numerous reports on technology and development and has presented around the world on efforts to close the digital divide. Arndt Husar facilitates the effective use of digital technology, advising ADB clients, regional departments, as well as sector and thematic groups on digital transformation. " Digital Connectivity and Low Earth Orbit Satellite Constellations: Opportunities for Asia and the Pacific." (2021).

Satellite communication plays a necessary role in the global connectivity ecosystem, connecting rural and remote populations, providing backhaul connectivity to mobile cellular networks, and rapidly establishing communication in emergency and disaster response scenarios. This Asian Development Bank (ADB) Sustainable Development Working Paper, the first in a series reviewing emerging innovations in connectivity technologies, focuses on low Earth orbit (LEO) satellites, which have been in deployment for decades and are again a subject of intensive investment as new large constellations are in early stages of deployment. These new LEO constellations, such as those being deployed by Starlink by SpaceX, Project Kuiper by Amazon, OneWeb, Lightspeed by Telesat, among others, may prove to be transformational to the connectivity landscape based on their global coverage and their suitability for areas not served by fiber optic cable networks. ADB’s developing member countries are well placed to leverage and benefit from this expansion of internet connectivity, particularly for underserved geographies and countries with limited international internet bandwidth, such as landlocked developing countries and small island developing states. With their global reach and coverage, LEO constellations are expected to dramatically expand the availability of high-speed broadband internet access with levels of service that rival fiber optic cables in terms of speed and latency, and at significantly reduced price levels compared to traditional geostationary satellites. A proactive engagement with LEO solutions is likely to yield benefits as the relevant business models are still evolving. Well-informed early action by regulators and investors can ensure that developing member countries prepare for opportunities presented by the anticipated expansion of connectivity bandwidth. I. IntRoDUCtIon This Emerging Connectivity Innovations Case Study on SpaceX Starlink and low Earth orbit (LEO) satellite constellations is intended to provide readers, particularly in developing countries in Asia and the Pacific, with a background understanding of the role of satellite communications in global internet connectivity and an exploration of the potential impact of the next generation of LEO constellation systems. While the adoption of internet connectivity across the world has generally increased incrementally, some innovations have been transformational, dramatically expanding the geographic reach of connectivity and bandwidth capacity. For example, the introduction of basic mobile phones in the late 1990s and early 2000s led to rapid adoption of mobile telephony across low- and middle-income countries (a phenomenon known as the “mobile miracle”). Similarly, public and private investment in undersea fiber optic cables circling sub-Saharan Africa in the 2000s significantly reduced the cost of bandwidth in many countries in the region. Satellites have used low Earth orbits since the beginning of space exploration; however, private investment in LEO constellations, consisting of hundreds or thousands of satellites, has been limited because significant up-front capital expenditure is required. While it remains to be seen how the next generation of LEO satellite constellations will evolve, LEOs are forecasted to significantly increase the available internet bandwidth in remote and rural geographies not currently served by fiber optic cables. This increased bandwidth could be leveraged to increase economic and social development opportunities for individuals, organizations, businesses, and government facilities (including public schools) located in these areas, provided that the private sector satellite companies investing in LEO constellations see market opportunities to extend service to these areas. This case study is intended to introduce to Asian Development Bank developing member countries how to start preparing for the expansion of LEO satellite communication services. II. BACKGRoUnD: sAteLLIte ConneCtIVItY As A MeAns FoR BRoADBAnD InteRnet Internet connectivity has become a necessary component of every country’s critical infrastructure given the reliance of all aspects of economic activity, governance, and social development on internet communications. The coronavirus disease (COVID-19) pandemic dramatically increased the importance of internet communications infrastructure. Trade, employment, learning, leisure, and communications quickly shifted into the digital sphere and countries with robust internet infrastructure and high adoption rates of internet-enabled devices were better able to adjust and adapt to the shift to digital activity. The United Nations estimates that 1.6 billion learners were affected by school closures in 2020, affecting 94% of the world’s student population and up to 99% in low and lower middle-income countries.1 1 United Nations. 2020. Policy Brief: Education during COVID-10 and beyond. 2 ADB Sustainable Development Working Paper Series No. 76 Access to distance learning opportunities varies greatly by country and income groups, with estimates of less than half of students in low-income countries able to access distance learning.2 Internet access and adoption in the developing member countries (DMCs) of the Asian Development Bank (ADB) continues to grow, particularly as a result of public and private investment in telecommunications infrastructure, increased competition, and allocation of shared resources, such as spectrum auctions and assignment. Despite these efforts, large access gaps remain in Asia, where the most remote, difficult to reach, or sparsely populated districts remain disconnected, leaving more than half of the population without access to the internet. This lack of digital infrastructure represents a missed opportunity to accelerate economic and social development. Despite the rapid expansion of internet connectivity infrastructure across the world, significant gaps in internet adoption and infrastructure access remain. This highlights the importance of satellite communications that can bridge gaps, swiftly expand network coverage, and enhance existing infrastructure. The latest estimates from the International Telecommunication Union (ITU) show that 3.7 billion people are still not participating online (49% of the global population), and 63% of rural households are without internet access (Figure 1).3 Also, 1.5 billion people reside in areas without high-speed mobile data coverage (fourth generation long-term evolution or 4G LTE), while 607 million people reside in areas with no mobile data coverage at all (at least 4G or third generation [3G] coverage). Furthermore, 313 million people reside in areas with only basic voice and short messaging service (SMS) coverage (second generation [2G]), and 220 million people reside in areas with no cellular coverage. The ITU estimates that nearly $428 billion is required to achieve universal access to broadband globally, $251 billion of which is required for Asia, with approximately 75% coming from the private sector and the remainder with support from the public sector.4 The majority of the world’s population, over 5 billion people, live more than 10 kilometers (km) away from any fiber optic cable infrastructure (3.6 billion reside more than 25 km away).5 Other issues, such as affordability, digital literacy, and the lack of relevant or local language content, have resulted in 2.4 billion people who live within 4G coverage not subscribing to 4G data services. [FIGURE 1 OMITTED] Satellite connectivity is predominantly used for backhaul connectivity for remote cellular base stations and as a last-mile connection for individual subscribers and enterprises. Figure 2 provides an overview of the internet infrastructure network components, from international connectivity to the last mile. Because of the higher relative cost of bandwidth transmitted via satellite versus terrestrial technologies, satellite is currently primarily used in situations where fiber optic cables and other high-capacity technologies are not financially viable due to low population densities and large distances between high-capacity networks and last-mile networks.6 However, in a few cases, satellite connectivity is relied upon for international internet gateway traffic or as part of a country’s core network. For landlocked developing countries that are dependent on terrestrial fiber connectivity, in some cases, satellite connectivity serves as a substitute to complex bilateral and multilateral negotiations to extend costly fiber connectivity to their country. [FIGURE 2 OMITTED] Satellite connectivity is predominantly used for backhaul connectivity for remote cellular base stations and as a last-mile connection for individual subscribers and enterprises. Figure 2 provides an overview of the internet infrastructure network components, from international connectivity to the last mile. Because of the higher relative cost of bandwidth transmitted via satellite versus terrestrial technologies, satellite is currently primarily used in situations where fiber optic cables and other high-capacity technologies are not financially viable due to low population densities and large distances between high-capacity networks and last-mile networks.6 However, in a few cases, satellite connectivity is relied upon for international internet gateway traffic or as part of a country’s core network. For landlocked developing countries that are dependent on terrestrial fiber connectivity, in some cases, satellite connectivity serves as a substitute to complex bilateral and multilateral negotiations to extend costly fiber connectivity to their country. Particularly in situations where a high degree of data throughput is required per site, such as satellite backhaul for broadband cellular networks, the data volumes as well as the distance to the nearest backbone node play a significant role in cost comparisons between satellite connectivity versus terrestrial network deployments (microwave backhaul, in particular). Figure 4 illustrates how higher data bandwidth requirements are more cost-effectively supplied by terrestrial ground networks; however, a crossover point occurs where satellite capacity may end up being more cost-competitive, depending on different price points of satellite bandwidth and total traffic demand per month.12 Satellite connectivity is also well- suited to deploy in emergency situations, such as in response to natural disasters or other external shocks, that require expeditious deployment of network connectivity where terrestrial infrastructure is either nonexistent or destroyed. For many rural and remote communities, satellites are the only connectivity option. For geographies without direct access to fiber optic cable infrastructure or at great distances from high- capacity bandwidth capacity, satellite connectivity is the only option available. Even where terrestrial network infrastructure that could be used for backhaul connectivity is available, satellite deployments may still be preferred because satellite terminals require only electrical power and a clear line of sight to the sky. However, an expansion of terrestrial infrastructure usually requires extensive civil works (underground fiber ducts, pole attachments, or tower construction for cellular base stations), which comes with challenges such as securing the rights-of-way, permits, and having to pay the related fees. Satellite broadband is poised to become an even more important technology for addressing the growing digital divide. As information and communication technologies play an increasingly important role in commerce, government services, health care, education, and other sectors, satellite connectivity allows communities to get connected swiftly, bypassing the infrastructure deployment challenges that come with terrestrial infrastructure deployments. The role of satellite connectivity in emergency telecommunications has also been vital where the communications satellites are heavily relied upon in disaster recovery efforts.13 Satellite technology may also be complementary with traditional wired and mobile broadband, which are better suited for densely populated areas. Satellite service could become a default solution for remote areas, allowing terrestrial services to focus on improving access in their current coverage areas. Satellite connectivity is already being used for network redundancy at national levels for international internet capacity, as well as for backup in core and backhaul networks.14 The recent $50 million loan to Kacific by ADB for the deployment of a broadband satellite, which covers large parts of Southeast Asia and the Pacific, demonstrates the relevance of satellite connectivity for unserved and underserved regions.15 By deploying new satellite technology (in the Ka-band16), Kacific’s service offering is commercially viable despite the existing presence of other major competitors in Asia and the Pacific, including global entities such as Intelsat, SES, and Eutelsat, as well as more regional players such as AsiaSat, Thaicom, MEASAT, and SKY Perfect JSAT.

#### The Asia-Pacific is the most disaster-prone region in the world – the next catastrophe is a question of when, not if

Thomas Bickford et al 15, Ph.D., senior research scientist in CNA Corporation’s China Studies division, “The Role of the U.S. Army in Asia,” May, https://www.cna.org/CNA\_files/PDF/CRM-2015-U-010431-Final.pdf

Natural disasters As Typhoon Haiyan amply demonstrated when it hit the Philippines in November 2013, natural disasters can represent a significant threat to human security. In 2012, the Asia-Pacific region experienced 93 natural disasters, which affected some 75 million people.206 It is one of the most disaster-prone regions in the world:207 it is prone to typhoons and cyclones; it contains some of the world’s most active faults and volcanos; and many areas experience massive flooding. As former USARPAC commander Lieutenant General Wiercinski has noted, the only questions are when and where the next big disaster will occur. Admiral Locklear, Commander, USPACOM has noted that climate change is one of the region’s most pressing security challenges.209 While the ability to respond to natural disasters varies widely among countries in the region, even advanced countries can require international assistance, as Japan did after the March 2011 earthquake and tsunami.

#### Disasters are an existential threat---it’s try or die for response and coordination.

Frederick Tipson 13, adviser to the USIP Center of Innovation on Science, Technology, and Peacebuilding whose career has included positions in the UN Development Programme, Microsoft, Hongkong Telecom, AT&T, the Markle Foundation, the Senate Foreign Relations Committee, and the University of Virginia Law School, BA in History from Stanford, MA in IR from Yale, PhD and JD from UVA, “Natural Disasters as Threats to Peace”, 2013, United States Institute of Peace, <https://www.usip.org/sites/default/files/resources/Natural%20Disasters%20as%20Threats%20to%20Peace%20SR324.pdf> //hhb

As the three spheres of our habitat evolve and erupt, human beings frequently get in the way. Natural hazards become humanitarian disasters when they expose and exacerbate human vulnerabilities—those characteristics of societies that limit their ability to avoid major damage and recover quickly.3 Such vulnerabilities range from very concrete weaknesses in infrastructure or the exposed locations of large populated areas to more intangible dimensions of economic fragility, social cohesion, and political capacity, which affect both preparedness and recovery. Although the recent historical pattern of major storms, droughts, and earthquakes can be traced (see map 1 at the end of this report), the extent of human vulnerabilities is a complex and subjective matter, often evident only after the fact. Mortality figures are typically used as indicators of the severity of disasters. By that measure, the three worst disasters in the world since 1950 were the earthquake in Tangshan, China, in 1976 (250,000 dead), the earthquake and tsunami in the Indian Ocean in 2004 (240,000 dead), and the earthquake in Haiti in 2010 (316,000 dead).4 These three earthquakes were by no means the largest in that sixty-year time frame, but they occurred where large numbers of people were exposed and unable to protect themselves. Severity also can be measured by other direct effects: destruction, dislocation, and disease. The 2010 earthquake in Haiti not only killed more than 300,000 people but injured an additional 300,000, affected 3.7 million (30 percent of the total population), caused $8 billion in damage, and was followed by 470,000 cases of cholera with 6,631 attributable deaths. The death rate from an earthquake, hurricane, or epidemic is generally much higher in poorer societies than in richer ones, where economic damage is usually the more numerically impressive consequence. Because their constituents have come to recognize how much the damage from “acts of God” can be affected by the actions, or inactions, of human beings, political leaders are increasingly being held accountable for minimizing the foreseeable risks of extreme events. “Natural Hazards, UnNatural Disasters: The Economics of Effective Prevention” is the indicative title of one important report by the United Nations and the World Bank. Reducing the risks begins with the recognition of how vulnerable many people have become. Throughout the world, in both wealthy and poor countries, ever-larger concentrations of people live in exposed locations under fragile or unprotected conditions. Infrastructure is often inadequate or deteriorating, and there is little or no awareness or preparation even for likely natural events. Those most exposed include millions in low-lying shorelines or coastal wetlands, marginal urban slums, and huge “temporary” settlements of internally displaced persons or refugees. Many of these populations depend on international humanitarian agencies to provide food and medicine and to assist local authorities in assuring adequate water, sanitation, health services, and shelter. As urban populations grow and conditions deteriorate further, reliable access to these necessities is becoming increasingly problematic for more and more people. Demographic trends best convey the scale of the challenges. In less than twenty years, the global population will rise from 7.1 billion to more than 8 billion. Key countries will grow even more rapidly. Between 2010 and 2025, Egypt is projected to grow from 81 million people to 106 million, Pakistan from 174 million to 234 million, and Nigeria from 159 million to 258 million.5 Many more people around the world will attain middle-class incomes, but a large percentage in many countries will be young and unemployed. Half the world’s population is already twenty-five years old or younger. Projections suggest that, by 2030, the world will need to provide fifty percent more food and additional fresh water equivalent to twenty new Nile Rivers.6 In that time frame, the needs of many countries, including India and China, will begin to exceed foreseeable water supplies for consumption and irrigation. The growth of earthquake-prone megacities is perhaps most telling of all. In just over a decade, metropolitan Jakarta will go from 9.6 million to 12.8 million people, Mexico City from 20 million to 24.6 million, Delhi from 22 million to 32.9 million, and Tokyo from 37 million to nearly 40 million—and these are just four of the thirty-seven cities that will then have populations greater than 10 million.7 There were only twenty-three in 2011. One of every seven or eight people in the world will be living in one of these massive metropolises, many in huge urban slums that have few, if any, services or infrastructure. Such concentrated population centers are extremely vulnerable to even normal patterns of earthquakes, storms, drought, and disease (see map 2). Epidemics that spread within such populations are especially difficult to contain. Climate volatility adds a further dimension of growing risk. Current changes in the climate of key regions portend severe near-term effects, whether or not the consequences of global warming match the worst predictions for the longer term. Since the 1980s the number of recorded natural disasters related to weather and climate has roughly doubled. According to the above-mentioned United Nations-World Bank report, “If there is no conscious change in adaptation policies to extreme events, baseline damages [even] without climate change are expected to triple to $185 billion a year from economic and population growth alone”8 (emphasis added). Nor are these risks confined to poor or middle-income countries. The world’s largest reinsurance companies, Munich Re and Swiss Re, warn of major increases in weather-related damage in both North America and Europe over the next decade.9 Contrary to critiques from global warming skeptics, the scientific and intelligence communities actually have been cautious in predicting the human effects of climate change. The April 2012 report of the Intergovernmental Panel on Climate Change (IPCC) is relatively conservative in forecasting future climate-induced disasters.10 Likewise, the National Intelligence Council handles climate change and natural disasters in a largely conventional and understated manner.11 However, an increasing number of authoritative reports have begun to highlight the dire risks of current climate trends and the need to begin assessing the potential for plausible adverse scenarios. Both the World Bank and the UN Environment Programme warned recently that the likely rise in global mean temperatures will exceed key thresholds sooner than previously expected, with implications for both severe weather and ocean surges.12 Security specialists are beginning to take these trends to heart. The Defense Science Board warned in its 2011 report that climate changes in key regions will interact with other vulnerabilities to become serious “threat multipliers.”13 The World Economic Forum highlights the interactive implications of climate changes with governance, fiscal, population, and technology vulnerabilities.14 A recent report of the National Research Council called on foreign policy experts to consider more systematically the political and security implications of foreseeable climate changes, suggesting that “it is prudent for security analysts to expect climate surprises in the coming decade, including unexpected and potentially disruptive single events as well as conjunctions of events occurring simultaneously or in sequence, and for them to become progressively more serious and more frequent thereafter, most likely at an accelerating rate.”15 Despite the pervasive dysfunction of most governments in addressing “climate surprises” and other disaster vulnerabilities, we will no doubt see environmental risks beginning to shape the political expectations of senior officials and thought leaders. As in the Cold War or the current ”war on terror,” responsible policymakers must look not only to the familiar and most imminent threats but also to less likely but higher-impact scenarios that could be truly catastrophic for national security, particularly if sudden and unanticipated.16 Not unlike other threats to peace and security, the inability to predict with certainty the location and timing of future natural disasters should not obscure a nation’s vital interest in assessing their likelihood and potential aftereffects.

Local Catastrophes and Global Repercussions

The challenge is to envision plausible threats and sequential patterns of potential danger—not to scare people but to anticipate potential consequences and devise strategies to prevent or reduce economic, political, and social damage. The National Research Council suggests using analytical “stress” tests of particular countries or regions to envision the effects of major disasters, or clusters of disasters, even if some of them should be considered unlikely. History offers examples of catastrophes that illustrate the possible ripple effects from otherwise local disasters. The Lisbon earthquake, tsunami, and fire of 1755 destroyed that city and decisively degraded Portugal’s role as an imperial power.17 The Spanish flu epidemic of 1918–20 killed an estimated fifty million to one hundred million people worldwide and was particularly lethal among young adults, compounding the immense losses to that generation from World War I. More recently, the destruction from Hurricane Katrina on the U.S. Gulf Coast in 2005; the earthquake, tsunami, and nuclear shutdown in Fukushima, Japan in 2011; and Tropical Storm Sandy on the U.S East Coast in 2012 exposed the interconnected vulnerabilities of coastal settlements, energy infrastructures, health-care facilities, and large-scale relief and recovery operations—a complex combination for which neither the United States nor Japan was adequately prepared. Major localized disasters do not always result in irreversible setbacks. The Chicago Fire of 1871, the Boston Fire of 1872, and the San Francisco Earthquake of 1906 resulted in the major reconstruction of all three cities, making each of them more economically vibrant and resilient.18 New York will undoubtedly be better prepared after Sandy, as New Orleans was after Katrina when it faced Hurricane Isaac in August 2012. Yet both disaster specialists and mainstream media too often treat natural disasters as limited and local matters. Media focus has typically been more on immediate suffering than larger implications, direct effects than long-term consequences, and infrastructure repair than major institutional reforms. Nevertheless, as the number and scale of natural disasters increases, we are likely to witness growing public awareness and anxiety about the vulnerability of certain areas, which will become a strong political factor adding to the wider and longer-term consequences of disasters. Internet technologies will facilitate not only the rapid dissemination of distressing information about natural disasters and severe environmental conditions but also the potential for exaggerated predictions, political incitement, conspiracy theories, or even popular panic. Worst-case scenarios may then become urgent political focal points, especially those that illustrate the fragility of economic necessities, social cohesion, or public safety.19 Economic Cascades The most troubling scenarios of natural disasters involve those with simultaneous effects on major essentials: food, water, land, medicine, energy, or subsistence income. An overlapping series of earthquakes, floods, and food shortages affecting a megacity could overwhelm the capacity of national and international agencies to respond adequately. Other consequences could follow: The Fukushima nuclear meltdown, for example, led both the Japanese and German governments to announce the phasing out of their nuclear power industries—a major blow to any prospect of curbing global carbon emissions.20 Disruptive disasters in major food-producing regions could have dire global consequences. Corn, wheat, and rice crop failures would lead to price hikes and shortages in far-flung locations. The worldwide collapse of one of these major staples—for example, from a new fungal infestation in one region and a drought in another—could lead to famines, export cutoffs, stockpiling and hoarding, or cartelized supply arrangements. Such developments could create new zones of instability, hostility, and populist pretexts for aggressive steps to secure new supplies or assure future access. The drive to guarantee food sources has already prompted the governments of China, Korea, Saudi Arabia, and others to buy land in Africa and Latin America for growing food that could be diverted from global markets during shortages. Water shortages could be another cause of future conflicts. Recent intelligence analyses suggest that countries are unlikely to go to war over water,21 but the larger patterns of depletion and diversion—glacial melts in South Asia and the Andes; upstream dams in the Middle East, East Africa, and Southeast Asia; widening drought in sub-Saharan Africa—suggest that peacefully resolving some disputes over severe water shortages could be very difficult. The genocides in Rwanda and Darfur owed much to the pressures of land, food, and water competition in fomenting ethnic conflicts.22 Medicine can be another life-and-death necessity in times of emergency. It is not difficult to imagine that the government of a state facing the prospect of a deadly epidemic would take steps to seize or intercept supplies of essential medicines. After European and U.S. laboratories cloned the lethal H5N1 virus, Indonesia demanded access to the vaccine formulas to assure adequate supplies for its huge population at reasonable cost. A global pandemic from that virus or a similar microorganism could lead to travel restrictions, news blackouts, and other isolationist reactions, but also to more aggressive measures to obtain lifesaving medicine. Massive casualties could undermine the standard protocols of global cooperation among international and national agencies, reducing global effectiveness in containing disease.23 Natural disasters can also sever transportation and communication links and global supply chains—life lines for necessities—compounding the catastrophe where the disaster occurs and affecting employment even in distant locations. In 2011 both the Thai floods and the Japanese earthquake and tsunami disasters affected hard-disk and auto suppliers, causing factory shutdowns and end-product shortages on other continents. The volcanic dust cloud from Iceland in 2010 halted European air traffic for only a week or so but even then had significant effects on both business and tourism. Compare this with the massive 1883 eruption of Krakatoa and the 1815 eruption of Mount Tambora, both in Indonesia, which created longer-lasting effects around the world. The Tambora event led to what was then called “The Year Without a Summer,” because of the adverse effects on U.S. and European weather patterns.24 Social Collapse Major disasters can have social consequences when the intense stress of damage and recovery causes breaks along ethnic, religious, class, or geographic fault lines. A major earthquake in a megacity could produce violent confrontations among groups competing for scarce relief supplies and recovery assistance. Or the disaster might create reverse-urbanization pressures for millions of homeless and jobless people in suddenly uninhabitable slums. Once again, the purpose of discussing such scenarios is not to suggest that social chaos following a disaster is a given but rather to consider ways to prevent, or at least reduce, that possibility. The major quake that struck Mexico City in 1985 produced not widespread strife but inspiring solidarity in local relief and recovery operations, even among the poorest citizens.25 That city is now a prime candidate for even bigger quakes, affecting an even larger population. Joint planning for such a crisis by the United States and Mexico could reduce the possibility of greater casualties and infrastructure losses that might impel hundreds of thousands to seek entry into the United States. Sudden large-scale migrations are an increasing prospect among the effects of climate change. Low-lying islands, flood-prone coastal areas, large refugee camps, and regions of prolonged drought could provoke major population movements. The possibility of Bangladeshis pouring into India to escape delta flooding has already led the Indian government to construct a 4,000-kilometer fence to forestall such influxes. Mass migration from Africa to Europe could also result from the droughts and floods affecting an increasing number of areas. Within the continent, such forced movement could compound urbanization trends. Such cataclysms are unlikely to occur without violence.

Political Catalysts

Natural disasters can dramatically expose deep social inequities and government indifference or incompetence, fomenting opposition movements. In 1970, the government in western Pakistan responded so poorly to the cyclone that struck eastern Pakistan that it strongly contributed to the secession of what became Bangladesh. The Nicaraguan earthquake in 1972 fatally discredited the Somoza regime. The Myanmar government’s heartless response to Cyclone Nargis in 2008 was likely a further factor in the military regime’s political vulnerability and may have accelerated the recent transition there. An unprecedented drought in Syria from 2006 to 2010 disrupted agriculture in regions that then became strong supporters of the armed resistance.26 The rise in global food prices that began with a severe drought in Russia in the summer of 2010 was a key factor in provoking popular uprisings in various Arab states the following year.27 An earthquake and tsunami near Jakarta—40 percent of which is below sea level and frequently inundated by heavy rains—could render much of that city uninhabitable and set back Indonesia’s economic growth and democratic development for years. It could also reduce the country’s ability to cooperate on global issues, such as deforestation or pandemic prevention, on which its involvement has been crucial.28 An earthquake in Karachi or Delhi or a major flood in Mumbai or Lagos could cripple the economies of their respective countries and further degrade the effectiveness of government authorities to avoid serious ethnic, sectarian, or even international conflicts. Major deterioration of any one of these cities could undermine the stability of their respective regions, with direct economic and possibly military consequences for the United States. Weak governments or failed states lack the capacity to prevent even moderate disasters from becoming severe crises. For any of the above scenarios, it is insufficient for only government agencies to be aware or prepared. As the extent of global fragility in the face of natural disasters becomes more widely felt, the public may sense the start of a regional or even global slide toward scarcities of various kinds, leading to political pressures for more secure sources of necessities. Such pressures increase the risk of international confrontation and present opportunities for exploitation by terrorists, criminals, or fanatics who see increased mayhem as in their interest.29

Defensive Measures and Strategic Adjustments

Efforts to reduce the severity of natural disasters and contain their larger consequences will require three kinds of initiatives: stoic, heroic, and “ecozoic.”

Stoic Resilience

Humans continue to cope with natural disasters largely as they always have, by “weathering” them: riding out storms, putting out fires, waiting out droughts, and helping out their neighbors. The capacity of societies to withstand catastrophes is generally referred to as resilience. Such resilience depends on physical, economic, cultural, and political factors that determine a society’s ability to plan for and recover from disasters without creating major social and economic fallout. These capabilities are almost entirely the “stoic” achievements of local people—namely, doing what is necessary to survive and prosper in the places they inhabit. As with all preventive efforts, the benefits of investing in resilient infrastructure and sensible preparedness far outweigh the costs of coping with the consequences after disasters strike. Strong and enforced building codes; zoning restrictions in coastal areas; prepositioned shelters and supplies; accessible hospitals, clinics, and health workers; wellpublicized evacuation routes; and other aspects of public awareness all make a substantial difference in reducing casualties and damage. Media coverage can sometimes give the impression that those most affected by disasters depend mainly on responses from outsiders, but the reality in most cases is otherwise. People in the path of a natural event are almost always most effective in helping each other, comprising the overwhelming proportion of first and subsequent responders.30 However, the United States is neglecting a range of major domestic vulnerabilities to natural hazards that could have catastrophic consequences.31 Stephen Flynn has most ably summarized these and other ominous features of what he calls our “brittle nation.”32 The vulnerability of coastal developments along the Eastern seaboard, so tragically demonstrated during Tropical Storm Sandy, is one continuing danger. On the opposite side of the country, earthquakes present the more ominous threat. As Flynn recounts, the deteriorating earthen levees that currently protect the massive farmlands of California’s Central Valley are vulnerable to seismic effects. If seawater were to breach the levees after a major earthquake, it would contaminate one of the country’s most important food and employment sources for years to come. Prolonged heat waves and drought in the Midwest, even worse than those in 2012, could permanently devastate croplands and damage the country’s strained and outdated electrical grid. As the U.S. public health infrastructure continues to degrade, deadly epidemics could severely reduce national economic performance and shake citizens’ confidence in the competence and reliability of government at all levels. The current economic stress and political paralysis in the United States complicate the country’s physical vulnerabilities. Debt levels and ongoing deficits substantially reduce the capacity of government agencies at all levels to address infrastructure and preparedness investments that reduce disaster risks. In 2012, even normally routine federal appropriations for disaster relief after Sandy became a political football.33 While most investments in community resilience, as well as in industrial and agricultural facilities, are state and local matters, congressional gridlock on many major issues indicates the difficulty that new assertions of federal authority or leadership would face in directing infrastructure changes or restricting flood zone settlements. The domestic vulnerabilities of the United States are further compounded by the global risks to vital U.S. interests resulting from the vulnerabilities of critical infrastructure and large populations around the world. While national development strategies increasingly emphasize “disaster risk reduction” and “sustainable economies”34 and certain countries, such as Bangladesh, Vietnam, and Mozambique, have successfully lowered their casualty rates from recurrent flooding through better preparedness and infrastructure changes, their examples are not widely imitated. Even their successes may be overwhelmed eventually by the expected scale of storms and ocean surges. Ethiopia and Rwanda have implemented food security policies that have increased their ability to cope with drought and other environmental challenges. But despite initiatives such as the U.S. Agency for International Development’s (USAID) Feed the Future program, the global prospects for substantial increases in food production are uncertain at best. Worldwide expenditures on health care, including infrastructure and training, experienced an exceptional increase over the last decade, especially from the U.S. government. However, both health and agricultural improvements depend on continued donor assistance, which has already fallen significantly since the global recession.35 Most fundamental to stoic readiness is the political capacity of societies to mobilize in the face of crises. Such capacity includes the ability to make decisions quickly and cohesively, to redirect funding rapidly without corruption, and to deliver supplies and support efficiently. Even effective democratic governments, such as those of Turkey or Indonesia, might find regional, ethnic, or religious diversity becoming a source of conflict in the wake of a massive natural disaster. More troubled federal polities, such as Pakistan or Nigeria, could unravel, although Pakistan has handled three successive seasons of massive flooding with remarkable resilience. In failed or failing states, government capabilities are especially lacking, and such political capacity is the most difficult set of skills and institutions to improve, even with major development assistance from outsiders.36 International organizations and financial institutions increasingly promote disaster risk reduction. Both the World Bank and the agencies of the UN system, led by the United Nations Development Programme, advocate investments that increase resilience to environmental challenges. But the resources to back up these recommendations are not commensurate. For example, under the impetus of the 1997 Kyoto Protocol on climate change, an adaptation fund to assist with risk reductions was initiated in 2001. But that fund was not actually launched until 2007, and despite the creation of a similar green climate fund at the Copenhagen climate change summit in 2009, both initiatives remain woefully underfunded—as highlighted in the latest global gathering on climate change in Doha.37 With a huge imbalance between growing global risks to large populations and declining investments in resilience, U.S. leaders will be forced to make difficult choices. U.S. policies on development assistance will likely have to adopt a form of preventive triage, placing scarce assistance dollars where they will have the most enduring effects on resilience and adjustment, rather than where the needs of poverty reduction and other objectives of the UN’s Millennium Development Goals (MDGs) might otherwise seem greatest. Already the efforts to set a new agenda for development after the deadline for the MDGs in 2015 include some recognition of the need for a more pragmatic view of sustainability. But as with the MDGs, the political dimensions of resilience continue to receive little emphasis in current drafts of these global manifestos.

Heroic Relief

Increased resilience must be matched with enhanced capabilities for effective relief. Improving the scale and effectiveness of assistance to the victims of disasters is an essential priority not only for limiting immediate effects but also for containing political fallout. In the United States, specialized national agencies, such as the Federal Emergency Management Agency (FEMA) and the American Red Cross, are the principal organizers of emergency support, supplemented by state-level agencies, the National Guard, and countless local and national non-governmental organizations (NGOs).38 Since Hurricane Katrina in 2005, all these actors have demonstrated improved capacities to deal with storms, even as available resources for future crises are in decline. Most other developed countries have similar, though mainly national, agencies to lead relief operations. In poorer countries, capacities are more variable, often either completely localized or highly dependent on national military agencies, as evidenced during the 2004 tsunami in the Indian Ocean. The National Disaster Management Authority of Pakistan, in its response to the massive floods of 2010 and 2011, has been one of the notable civilian exceptions. Assistance to the most at-risk countries to increase their own capacity for humanitarian relief should be a donor priority. Resources for humanitarian assistance from national donor agencies have seen major growth in the past twenty years. In the United States, funding for foreign disaster assistance has had strong bipartisan support in Congress for many years, and humanitarian relief resonates strongly with large portions of the U.S. electorate. The Office of Foreign Disaster Assistance (OFDA) within USAID has had a record of operational excellence and effectiveness. Other governments also have made international humanitarian assistance a high priority. Scandinavian ministries, the United Kingdom’s Department for International Development (DFID), and the European Commission’s Solidarity Fund have been especially generous contributors to relief operations in recent times, both directly and through UN agencies. The role of major international NGOs, corporate philanthropy, and foundations has also grown, with resources that sometimes exceed those from official sources. With the expansion of heroic generosity, the delivery of disaster assistance has become a major international industry. Large companies and suppliers sell their goods and services in the wake of each major event. NGOs similarly follow devastation and suffering from place to place. Many take advantage of public attention and sympathy for disaster victims to raise large amounts of money for relief. However, the effectiveness of relief operations, and especially the transition from relief to recovery, often has been less than optimal. Repeated proposals have been made to create a more centrally coordinated system, and UN agency leaders have made major advances over the past two decades in coordinating and funding major international relief operations. In 1991, the General Assembly created an Inter-Agency Standing Committee (IASC) of UN agencies, a Central Emergency Revolving Fund (CERF), and an Emergency Relief Coordinator (ERC) within the UN secretariat. The latter evolved by the end of the 1990s into the Office for the Coordination of Humanitarian Affairs (OCHA), headed by the ERC with the rank of under-secretary-general. In 2005, following the Indian Ocean tsunami, IASC members agreed on an intensified approach to collaboration, dubbed the “cluster system,” which divided relief operations into major functional components and designated lead agencies in each sector to coordinate the work of both international organizations and NGOs. The current ERC, Valerie Amos from the United Kingdom, has undertaken further efforts to improve the performance of the relief community, in the process raising billions of dollars through consolidated appeals, including urgent “flash appeals” to donors. The January 2010 earthquake in Haiti, which received huge publicity and donations, highlighted both the best and worst features of the international cluster system—and of heroic relief efforts in general.39 Assistance followed a familiar pattern of initial energy and compassion that dissipated once the atmosphere of emergency and improvisation shifted to the long-term demands for major reconstruction and local government control. The influx of supplies and aid workers during the first year of relief was overwhelming. One year later, agencies reluctantly faced the need to shift their promises from “building back better” (as former President Clinton likes to put it)40 to the harsher choices involved in satisfying donors that their resources were accomplishing more immediate concrete effects. Addressing short-term basic human needs for water, food, and shelter—often to people living in large tent cities—is a different task from that of rebuilding basic infrastructure, restarting large and small businesses, and forging political institutions that endure after agencies depart. As all too often happens, the initial humanitarian response to Haiti was overly romantic, inconsistent, and insufficiently attuned to the unique features of the local culture, economy, and political system.41 With intense economic pressures on virtually all major donors, disillusionment with relief operations may result in political pressures to reduce assistance. Popular support for even the most sympathetic causes may begin to wither, including among generous Americans, especially if foreign crises multiply, or if the U.S. homeland itself is struck by major natural disasters that divert attention and resources to domestic priorities. The multilateral institutional cushions needed to mitigate the social, economic, and political fallout from extreme events remain ad hoc and undeveloped. G-8 and G-20 summit agendas pay some attention to these issues but with little evident follow-through from national governments.42 The UN Security Council, despite one famous session to address the security implications of HIV/AIDs in early 2000, has been erratic and unfocused in dealing with the broader security challenges of disease and disasters. As the council is the principal global institution responsible for addressing international “threats to the peace,” such neglect will need to be remedied. International financial institutions have standard approaches for assisting with disaster recovery, such as the emergency response programs of regional development banks, as well as the World Bank’s Emergency Recovery Loan program, Hazard Management Unit, and Global Facility for Disaster Reduction and Recovery (GFDRR). The International Monetary Fund has an emergency assistance facility designed to ease the fiscal effects of major disasters.43 But these economic mechanisms are not scaled for the size of the challenges ahead, and the international diplomatic and intelligence channels needed to address urgent political and security risks are relatively undeveloped. Even the example of the successful global efforts led by the World Health Organization in responding to pandemic threats from the SARS and avian flu viruses may not prevent national budget cuts in preventive and public health capacity.44 The same budgetary fate could befall otherwise promising initiatives to reduce food insecurities, such as those which the G-20 governments have endorsed. The international community deserves great credit for its recent heroic efforts to aid societies affected by natural disasters. But it is highly unlikely that multilateral relief operations are prepared to work at the necessary scale when disaster incidents multiply. As with future investments in resilience, some form of priority setting or triage may become the imposed standard for major international relief as well. Ecozoic Relocation Even the most effective combination of stoic and heroic efforts will not sustain vulnerable populations indefinitely. As sea levels and storm surges continue to rise, as key fisheries are contaminated or extinguished, as certain regions become inhospitable to agriculture, or as earthquakes or epidemics degrade the capacity of megacities to provide for their citizens, some currently inhabited parts of the planet will have to be scaled back, or even abandoned, for large-scale settlement. Particularly if global warming trends fulfill some scientific projections, the planet may impose wholesale and dramatic adjustments to the locations, dimensions, and lifestyles of human settlements on a scale akin to the major migrations imposed by ancient ice ages. Anticipating future adaptations of this magnitude, some scientists and philosophers have begun to refer to a coming “ecozoic” age of human adaptation.45 In the United States, such speculation will likely surface initially as more intense versions of familiar controversies over development or rebuilding in coastal areas or floodplains. These issues involve decisions about zoning, taxes, subsidized flood insurance,46 and the various publicly funded programs that promote or sustain coastal growth, such as beach reclamation or the building of wave barriers and dikes.47 Developers and local politicians often downplay disaster risks and the pressures from local citizens are almost always to rebuild rather than to abandon or relocate. Yet even the most stoic impulses must confront difficult choices. New Orleans is a prominent case in point regarding resettlement and reconstruction in areas prone to further flooding, such as the lower Ninth Ward. Hurricane Isaac demonstrated that the huge post-Katrina investments in floodwalls and levies involved decisions to protect certain areas at the expense of others. Such choices now confront officials and citizens on the Jersey Shore, Staten Island, and Long Island in the wake of Tropical Storm Sandy. The same issues will be replicated around the world. Government subsidies for hazard insurance or expensive engineering for stopgap measures, such as dikes, imported water supplies, or beach reclamation, will at some point no longer protect exposed populations enough to justify the resources needed to maintain them. As media coverage and public discussion increasingly focus on the most exposed areas, many people will begin to vote with their feet and look to resettle their families and businesses in areas less exposed to the hazards they witness across the globe. Real estate prices and infrastructure investments will increasingly reflect the realities of that new marketplace. Obvious areas of special exposure already justify “exit strategies” or migratory transitions. The former president of the Maldives, Mohamed Nasheed, has become a prominent spokesman for the fundamental threats of sea level increases to small island states.48 In other exposed areas—such as low-lying estuaries of Bangladesh, Burma, and Vietnam, as well as large areas of Africa—desertification, erosion, or salinization could render agriculture or adequate supplies of potable water infeasible. Water shortages may make areas of Central Asia and the Middle East impractical for continued settlement. On an even larger scale, some experts suggest that the expected growth of certain megacities will reach practical ceilings because of the physical and economic limitations of distributing food and water.49 Major epidemics could accelerate these pressures to limit or reduce some urban populations. The political and social dimensions of massive shifts in environment and population are difficult to predict, but the likelihood is that over time large groups of people will become ecologically displaced persons or “environmental refugees,” forced from their historic homelands and needing relocation to more hospitable places within or beyond national boundaries.50 Such transitions will present large political and economic challenges, both for long-term humanitarian support and for immigration laws and enforcement. If these movements involve millions of desperate people, geographic and political boundaries will become increasingly problematic. Recommendations: National Security and Global Solidarity The incidence of military conflicts between states is at a historic low; even the number of conflicts within states has declined steeply since the twentieth century.51 However, both trends could be slowed or reversed by increased vulnerabilities to natural disasters and the limits of political and economic capacity to deal with them. How should the challenges ahead be framed in terms of U.S. national security and the larger “threats to the peace”?

Citizen Safety Most governments place their highest priority on national security, which begins with ensuring the physical safety of their citizens, or as John Jay famously put it in The Federalist: “Among the many objects to which a wise and free people find it necessary to direct their attention, that of providing for their safety seems to be the first.”52 While they are used to thinking of such safety in terms of protection from attacks by military or terrorist adversaries, Americans also regard their fundamental security as dependent on access to reliable supplies of air, water, food, medicine, and shelter.53 All would likely place these subsistence needs above any threat currently on the horizon, foreign or domestic. However, it is leaders—thought leaders as well as political leaders—who define the priorities for government policy and expenditures in dealing with what they perceive as the greatest threats to the country and its citizens. Such definitions of national security generally arise as narratives developed in the course or aftermath of major international attacks or threats of attack. Historical turning points in these narratives over the last hundred years include, for example, the German attacks on U.S. shipping that provoked the country into World War I; the Japanese attack on Pearl Harbor that plunged the United States into World War II; the Berlin crisis, Korean War, and Soviet nuclear tests that intensified the Cold War; and the September 11, 2001, attacks that provoked the U.S. War on Terror. Whether or not all Americans agreed with the security rationales their leaders offered at those times, they provided bold assessments of the threats confronting the country, which gained wide acceptance. Each narrative was a necessary, and apparently sufficient, political basis to enlist political support for executive orders, policies, legislation, appropriations, treaties, and other international commitments that were consistent with the leaders’ justifications. At present there is no reasonable prospect that U.S. leaders would create a national security narrative focused on the cumulative threats from an overstressed planet.54 To mobilize popular support for the major initiatives necessary to reduce foreseeable risks, U.S. leaders would eventually have to shift their characterizations of such threats from environmental to existential and from futuristic (after 2050) to imminent (before 2020). That shift is unlikely until Americans experience a pattern of severe crises that would shift popular perceptions and political attitudes in decisively different directions. No one wants to contemplate the horrific disasters that might drive such a shift in attitudes, especially when the destruction from Katrina and Sandy seem not to have had such an effect on most political leaders. Political resistance to the recognition of these likely threats is reinforced by a suspicion that those who highlight them are also seeking to justify major government interventions and expenditures, involving severe changes in lifestyles. References to global warming, or even to obvious climate changes, sound to some audiences as code words to justify carbon caps and oil taxes. Therefore this report assumes that such mitigation programs are not foreseeable in time to avoid the climatic, economic, and demographic consequences of current trends. Indeed, it is because these trends will not be changed in time that steps must be taken to adapt to their likely effects. U.S. political and thought leaders need to fulfill their highest responsibility—for the safety of citizens—by beginning to consider a range of risk reduction policies, infrastructure investments, and preparedness strategies, including the necessary legislative and budgetary changes, that might constitute an approach to national security aimed at reducing the direct and secondary consequences of natural disasters. Whether or not the necessary stoic and heroic steps are all politically palatable, the larger arguments for them should at least be actively under current debate. As Stephen Flynn has emphasized, most of these steps would not only reduce U.S. vulnerability to extreme natural events but would also reduce the opportunities for terrorists to exploit the same vulnerabilities.55 How these competing political pressures will play out depends not only on the timing and locations of disasters but also on how soon the growing public perception of our vulnerabilities becomes a political reality. The combination in 2012 of major tornados, midwestern drought, Texas floods, Hurricane Isaac, western wildfires, Arctic ice depletion, and Tropical Storm Sandy could mark the beginning of a sea change in the electorate’s expectations of present and future exposure to natural disasters. In that event, the hardest challenge for U.S. leaders may well be to prevent the country from turning inward to focus on domestic priorities and resisting involvement in the crises of other countries or regions. Such isolationism could be expressed through intensified calls for energy independence, food selfsufficiency, foreign assistance cutoffs, and even military retrenchment. Reversing decades of generosity and pragmatism, donor fatigue and domestic needs could generate a new version of an “America First” constituency that opposes all such international engagement and punishes at the polls any politician who supports it. Collective Containment U.S. leaders also cannot ignore the national security implications of the most serious risks of disaster beyond our borders. The safety of U.S. citizens is inextricably bound through the global economy with the course of environmental events in other parts of the world. Disasters or extreme conditions that degrade major agricultural areas (Russian, Australian, or Argentinean wheat fields, Japanese, Burmese, Philippine rice), disrupt for prolonged periods key manufacturing, transportation, or communications infrastructure (greater Bangkok, Bosporus, European airspace), or create immense casualties among large stressed populations (pandemics in Pakistan, Brazil, Nigeria) could affect the stability of entire regions. The severe degradation of a megacity could snowball into wider instability and conflict if not managed collaboratively. The sooner and more deliberately U.S. leaders can articulate geographic, cultural, or economic justifications for targeting scarce assistance, the sooner they are to be persuasive to U.S. citizens. Political preparation is equally required of other governments and populations. If disasters multiply, U.S. influence with these countries will likely depend on the level of U.S. engagement, generosity, and leadership in promoting a sense of global solidarity through an agenda for collaboration on resilience, relief, and relocation options. For this purpose, the U.S. government will need to complement its domestic security rationale with a compelling diplomatic narrative that advocates the needs and priorities for dealing with events that might otherwise spark major confrontations. The alternative could well be aggressive measures by governments, desperate for necessities, to bypass market allocations or seize supplies by intercepting transports, deploying covert operations, or even initiating outright invasions. A series of functionally focused collaborations to identify and manage key risks could be indispensable to contain the political consequences of future extreme events. Whether the Security Council, the G-20, the World Health Organization, or some new or combined political coalition would be the locus for such negotiated understandings is unclear. But the likelihood is that all international institutions will have to elevate their focus and resources to address disaster scenarios and environmental vulnerabilities. The security agendas of politicians, policymakers, and intelligence personnel will likely be distracted, for the time being, by perceived dangers from rogue states armed with nuclear weapons, failed states and ungoverned areas as safe havens for terrorists, and economic criminals, such as cyberburglars, unfair traders, and intellectual property thieves. Meanwhile, the safety and prosperity of the United States, as well as peace throughout the world, increasingly will be endangered by unaddressed vulnerabilities to natural disasters and extreme environmental crises. Contention and conflict could also result from the sudden realization—or opportunistic exaggeration—among large groups of alarmed citizens that such vulnerabilities are both existential and irreversible. Given demographic and environmental trends, and the increasing vulnerabilities and probable shortages to be expected within this decade—and certainly before 2030—the threats to the peace from Mother Nature may soon come to dwarf any of the threats posed by mere mortals.

#### It competes.

Takaya et al 18 “The Principle of Non-Appropriation and the Exclusive Uses of LEO by Large Satellite Constellations” Yuri Takaya-Umehara [Visiting researcher at the University of Tokyo since April 2017. She was affiliated to the Kobe University to provide a course on space law to post-graduate students (2011-2017). She chairs a working group on the formulation of global norms in space law organized by the Keio University since 2018. She obtained her Ph.D. degree at the IDEST of Paris XI University in France, LL.M. at the Leiden University in the Netherlands.] Quentin Verspieren [Ph.D. in public policy @ The University of Tokyo, Assistant Professor of Space Policy @UTokyo, General Manager, Global Strategy @ArkEdge Space Inc., Associate Research Fellow @ESPI] Goutham Karthikeyan [The University of Tokyo & Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency (ISAS-JAXA)] 2018 https://www.researchgate.net/publication/328094878\_The\_Principle\_of\_Non-Appropriation\_and\_the\_Exclusive\_Use\_of\_LEO\_by\_Large\_Satellite\_Constellations SM

* LSC = large satellite constellations
* Outlines “L”SC thresholds

By investigating expected large satellite constellation projects and by reviewing existing interpretations of international space law, this paper argues that the exclusive use of specific LEO orbits by a large constellation of satellite could constitute a violation of the non-appropriation principle by means of occupation and by means of use, drawing a parallel between orbits as resources and the exploitation of tangible mineral resources in space. Based on this, the important question to be raised is what constitutes an exclusive use of a specific orbit. In other words, an important hurdle in the concrete evaluation of whether a planned or established constellation potentially violates the non-appropriation principle through an exclusive use of LEO resides in the lack of clear definition on what can be considered an exclusive use. While the authors claim that legal issue can be clearly solved in abstracto, it naturally shifts towards a regulatory challenge.

This regulatory challenge consists in first defining qualitatively what is the exclusive use of an orbit before translating this definition into measurable, technical rules. In this paper, the authors define an exclusive use of an orbit by a state40 as any use that would prevent/hinder the usage of the same orbit by any other state. Translating this definition into an applicable regulation could consist in defining a threshold of orbital collision risk or a threshold of density of satellites along an orbit based on its altitude, shape, relative velocity of neighbouring objects, etc. It is however not the purpose of this space law paper. What is more appropriate here is to think about which organization or forum would be in charge of elaborating this technical definition. Serious candidates could be the ITU, with excellent track-record in dealing with the use of the GEO region but which would have to review its “first come, first served” principle, or the UNCOPUOS, aiming for the widespread adoption of a new piece of international law. Moreover, even if its rules suffer from a low implementation rates, the IADC would be an appropriate discussion platform thanks to its very deep technical focus.

6. Conclusion

The various announced projects of LSC, also called mega-constellations, push existing regulations and practices to their limit, forcing researchers and practitioners around the world to rethink the applicability of existing space law principles to this new trend. In this paper, the authors, after providing background information on current LSC plans as well as recalling the legal status of the LEO region, investigate whether the deployment of an LSC having an exclusive use of an orbit constitutes a violation of the nonappropriation principle as stated in OST Article II. This paper concludes that:

The exclusive use of an orbit by an LSC constitutes a violation of the non-appropriation principle by means of occupation due to the innate nature of orbit being a specific location in space that can be occupied, but most notably by means of use, considering orbits as “limited natural resources” and invoking parallels with the exploitation of natural resources in outer space;

ITU’s “first come, first served” principle is reaching its limits with current LSC projects and should be re-evaluated;

The main challenge ahead is not legal but technical and regulatory and consists in defining precisely what can constitute an exclusive use of an orbit and in translating such definition into a clear regulation or code of conduct.

### 1NC – T

#### Interp – the aff must only defend that the appropriation of outer space by private entities is unjust.

#### Private entities are non-governmental.

Dunk 11 Von Der Dunk, Frans G. "1. The Origins Of Authorisation: Article VI Of The Outer Space Treaty And International Space Law." National Space Legislation in Europe. Brill Nijhoff, 2011. 3-28. (University of Nebraska)//Elmer

4. Interpreting Article VI of the Outer Space Treaty One main novel feature of Article VI stood out with reference to the role of private enterprise in this context. Contrary to the version o fthe concept applicable under general international law, where 'direct state responsibility' only pertained to acts somehow directly attributable to a state and states could only be addressed for acts by private actors under 'indirect', 'due care' / 'due diligence' responsibility18, Article VI made no difference as to whether the activities at issue were the state's own ("whether such activities are carried on by governmental agencies" ...) or those of private actors (... "or by non-governmental entities"). The interests of the Soviet Union in ensuring that, whomever would actually conduct a certain space activity, some state or other could be held responsible for its compliance with applicable rules of space law to that extent had prevailed. However, the general acceptance of Article VI as cornerstone of the Outer Space Treaty unfortunately was far from the end of the story. Partly, this was the consequence of key principles being left undefined.

#### Private entity is defined by

Cornell Law n.d. “private entity” <https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=6-USC-625312480-168358316&term_occur=999&term_src=title:6:chapter:6:subchapter:I:section:1501> TG

(A) In general Except as otherwise provided in this paragraph, the term “private entity” means any person or private group, organization, proprietorship, partnership, trust, cooperative, corporation, or other commercial or nonprofit entity, including an officer, employee, or agent thereof.

#### Violation – they’re extra topical – they defend public actors in addition to private entities – no plan text in a vacuum this is explicitly delinated in the 1AC and CX as something they defend – I’ll insert lines from the 1AC.

#### “deeming private appropriation unjust takes both public and private entities out. “

#### Vote neg for limits – extra-topicality allows them to tack on infinite planks to artificially improve aff solvency and spike out of DAs, like fiating enforcement or random possible modifications to extraterrestrial property rights. The counter-interp sets a precedent that the scope of aff fiat doesn’t have to be bounded by the resolution, which outweighs on magnitude. No drop the arg – we shouldn’t have to always read T just to get back to what we should’ve been debating to begin with – it incentivizes adding random extra-t planks because there’s no punishment.

#### Competing interpretations—it tells the negative what they do and do not have to prepare for. Reasonability is arbitrary and unpredictable, inviting a race to the bottom and we’ll win it links to our offense.

### 1NC – Case

#### The role of the ballot is to determine if the aff’s a good idea—anything else is self-serving, arbitrary and begs the question of the rest of the debate. Evaluate consequences

#### Biological death is the ultimate evil – it obliterates metaphysics and ontology

Paterson 3 - Department of Philosophy, Providence College, Rhode Island Craig, “A Life Not Worth Living?”, Studies in Christian Ethics, SAGE

Contrary to those accounts, I would argue that it is death per se that is really the objective evil for us, not because it deprives us of a prospective future of overall good judged better than the alternative of non-being. It cannot be about harm to a former person who has ceased to exist, for no person actually suffers from the sub-sequent non-participation. Rather**,** death in itself is an evil to us because it ontologically destroys the current existent subject — it is the ultimate in metaphysical lightening strikes.80 The evil of death is truly an ontological evil borne by the person who already exists, independently of calculations about better or worse possible lives. Such an evil need not be consciously experienced in order to be an evil for the kind of being a human person is. Death is an evil because of the change in kind it brings about, a change that is destructive of the type of entity that we essentially are. Anything, whether caused naturally or caused by human intervention (intentional or unintentional) that drastically interferes in the process of maintaining the person in existence is an objective evil for the person. What is crucially at stake here, and is dialectically supportive of the self-evidency of the basic good of human life, is that death is a radical interference with the current life process of the kind of being that we are. In consequence, death itself can be credibly thought of as a ‘primitive evil’ for all persons, regardless of the extent to which they are currently or prospectively capable of participating in a full array of the goods of life.81 In conclu sion, concerning willed human actions, it is justifiable to state thatany intentional rejection of human life itself cannot therefore be warranted since it is an expression of an ultimate disvalue for the subject, namely, the destruction of the present person; a radical ontological good that we cannot begin to weigh objectively against the travails of life in a rational manner. To deal with the sources of disvalue (pain, suffering, etc.) we should not seek to irrationally destroy the person, the very source and condition of all human possibility**.**

#### Focus on large scale catastrophes is good and they outweigh – appeals to social costs, moral rules, and securitization play into cognitive biases and flawed risk calculus – 2020 is living proof

Weber 20 (ELKE U. WEBER is Gerhard R. Andlinger Professor in Energy and the Environment and Professor of Psychology and Public Affairs at Princeton University.), November-December 2020 Issue, "Heads in the Sand," Foreign Affairs, <https://www.foreignaffairs.com/articles/2020-10-13/heads-sand> mvp

We are living in a time of crisis. From the immediate challenge of the COVID-19 pandemic to the looming existential threat of climate change, the world is grappling with massive global dangers—to say nothing of countless problems within countries, such as inequality, cyberattacks, unemployment, systemic racism, and obesity. In any given crisis, the right response is often clear. Wear a mask and keep away from other people. Burn less fossil fuel. Redistribute income. Protect digital infrastructure. The answers are out there. What’s lacking are governments that can translate them into actual policy. As a result, the crises continue. The death toll from the pandemic skyrockets, and the world makes dangerously slow progress on climate change, and so on.

It’s no secret how governments should react in times of crisis. First, they need to be nimble. Nimble means moving quickly, because problems often grow at exponential rates: a contagious virus, for example, or greenhouse gas emissions. That makes early action crucial and procrastination disastrous. Nimble also means adaptive. Policymakers need to continuously adjust their responses to crises as they learn from their own experience and from the work of scientists. Second, governments need to act wisely. That means incorporating the full range of scientific knowledge available about the problem at hand. It means embracing uncertainty, rather than willfully ignoring it. And it means thinking in terms of a long time horizon, rather than merely until the next election. But so often, policymakers are anything but nimble and wise. They are slow, inflexible, uninformed, overconfident, and myopic.

Why is everyone doing so badly? Part of the explanation lies in the inherent qualities of crises. Crises typically require navigating between risks. In the COVID-19 pandemic, policymakers want to save lives and jobs. With climate change, they seek a balance between avoiding extreme weather and allowing economic growth. Such tradeoffs are hard as it is, and they are further complicated by the fact that costs and benefits are not evenly distributed among stakeholders, making conflict a seemingly unavoidable part of any policy choice. Vested interests attempt to forestall needed action, using their money to influence decision-makers and the media. To make matters worse, policymakers must pay sustained attention to multiple issues and multiple constituencies over time. They must accept large amounts of uncertainty. Often, then, the easiest response is to stick with the status quo. But that can be a singularly dangerous response to many new hazards. After all, with the pandemic, business as usual would mean no social distancing. With climate change, it would mean continuing to burn fossil fuels.

But the explanation for humanity’s woeful response to crises goes beyond politics and incentives. To truly understand the failure to act, one must turn to human psychology. It is there that one can grasp the full impediments to proper decision-making—the cognitive biases, emotional reactions, and suboptimal shortcuts that hold policymakers back—and the tools to overcome them.

AVOIDING THE UNCOMFORTABLE

People are singularly bad at predicting and preparing for catastrophes. Many of these events are “black swans,” rare and unpredictable occurrences that most people find difficult to imagine, seemingly falling into the realm of science fiction. Others are “gray rhinos,” large and not uncommon threats that are still neglected until they stare you in the face (such as a coronavirus outbreak). Then there are “invisible gorillas,” threats in full view that should be noticed but aren’t—so named for a psychological experiment in which subjects watching a clip of a basketball game were so fixated on the players that they missed a person in a gorilla costume walking through the frame. Even professional forecasters, including security analysts, have a poor track record when it comes to accurately anticipating events. The COVID-19 crisis, in which a dystopic science-fiction narrative came to life and took everyone by surprise, serves as a cautionary tale about humans’ inability to foresee important events.

Not only do humans fail to anticipate crises; they also fail to respond rationally to them. At best, people display “bounded rationality,” the idea that instead of carefully considering their options and making perfectly rational decisions that optimize their preferences, humans in the real world act quickly and imperfectly, limited as they are by time and cognitive capacity. Add in the stress generated by crises, and their performance gets even worse.

Because humans don’t have enough time, information, or processing power to deliberate rationally, they have evolved easier ways of making decisions. They rely on their emotions, which serve as an early warning system of sorts: alerting people that they are in a positive context that can be explored and exploited or in a negative context where fight or flight is the appropriate response. They also rely on rules. To simplify decision-making, they might follow standard operating procedures or abide by some sort of moral code. They might decide to imitate the action taken by other people whom they trust or admire. They might follow what they perceive to be widespread norms. Out of habit, they might continue to do what they have been doing unless there is overwhelming evidence against it.

Not only do humans fail to anticipate crises; they also fail to respond rationally to them.

Humans evolved these shortcuts because they require little effort and work well in a broad range of situations. Without access to a real-time map of prey in different hunting grounds, for example, a prehistoric hunter might have resorted to a simple rule of thumb: look for animals where his fellow tribesmen found them yesterday. But in times of crisis, emotions and rules are not always helpful drivers of decision-making. High stakes, uncertainty, tradeoffs, and conflict—all elicit negative emotions, which can impede wise responses. Uncertainty is scary, as it signals an inability to predict what will happen, and what cannot be predicted might be deadly. The vast majority of people are already risk averse under normal circumstances. Under stress, they become even more so, and they retreat to the familiar comfort of the status quo. From gun laws to fossil fuel subsidies, once a piece of legislation is in place, it is hard to dislodge it, even when cost-benefit analysis argues for change.

#### Their Hardt evidence – we’ll concede they ban public entities too – however they’re not “private” because of the reasons defined on T – this just asserts over and over again that private and public are the same but there are several institutions that are still outside of the definition of private.

#### But we’ll still grant them that the plan bans them – we’re impact turning it.

#### Government developed ASATs are key to deterrence and asymmetric escalation capabilities---that caps conflicts from going nuclear---independently, solves Chinese DEWs.

Kartik Bommakanti 19. Associate Fellow with the Strategic Studies Program. 11-15-2019. “‘Soft Kill’ or ‘Hard Kill’? The requirements for India’s space and counter-space capabilities.” ORF Occasional Paper. https://www.orfonline.org/research/soft-kill-or-hard-kill-the-requirements-for-indias-space-and-counter-space-capabilities-57832/

II. KEWs: India’s Space Weapons and Balance of Power

A key justification for the development of space weapons is preserving the balance of power, which requires a state’s active effort to enhance its power and secure its interests against the dominant or near-dominant states in the international system. “Balancing” involves engineering a shift in the existing distribution of power, away from the dominant state in the system or region.[3]

India currently faces two adversarial states—China and Pakistan—both of them with active space military capabilities and having a history of strategic cooperation. To achieve a balance of power, India must improve its hard-kill and soft-kill capabilities in the space domain and work towards “internal balancing,” i.e. accumulating capabilities through domestic effort, instead of “external balancing,” i.e. relying on the power of other states.[4] Internal balancing gives a state the power to prevent the escalation of conflict and war. American realist scholar John J. Mearsheimer observed, “…the balance of power is largely synonymous with military power.”[5]

The success of India’s ASAT test of March 2019 demonstrated the country’s ground-launched KEW capability. However, the country’s kinetic capabilities are not without limitations vis-à-vis its situation with Pakistan and China. The challenge is summarised by Vipin Narang: “If Pakistan starts hitting Indian satellites, India can knock out Pakistan’s very few satellites whereas India cannot do the same to China. So it’s kind of a weird balance for India if it’s interested in getting into the anti-satellite deterrence game [because] it doesn’t really have an advantage in either of its dyads.”[6]

While Pakistan, too, does not have a confirmed kinetic capability, it could develop one with China’s assistance, which is consistent with Narang’s observation. According to another scholar, “…the number of countries able to undertake such intercepts is much larger…”[7] and Pakistan is one of them. While its space programme is not as expansive as India’s, Pakistan has an extensive missile programme and is in a position to undertake a KEW test in the not-so-distant future. (The barriers to entry in KEW-related space technology for states such as Pakistan, which is otherwise not a leading spacefaring nation, are not too high.)

Another legitimate concern is that a conventional war can escalate to a nuclear war, involving space as a domain and a medium. A potential two-front attack is one of the major reasons that India must develop triadic KEWs, since it gives the country asymmetric escalation capabilities, allowing it to put at considerable and direct risk both Chinese and Pakistani space assets. According to a 2015 Indian study, which ties partially into Narang’s reference to the two-front military challenge facing India, “There is also little doubt that space, nuclear weapons, conventional weapons and strategies of war and deterrence are now inextricably connected with each other.”[8] However, this statement is not entirely accurate, and in the context of India’s conflictual relationships with China and Pakistan, alternative scenarios are equally plausible. For example, in the event of a China–India war or an India–Pakistan war, traditional weapons and space weapons could be used without the involvement of nuclear arms. The Kargil conflict is an example of a “limited-aims conventional war,” fought under the cover of nuclear weapons.[9] Similar conflicts in the future, however, are likely to involve the space segment, especially in the case of a Sino-Indian military conflagration. On the other hand, a joint attack by China and Pakistan could potentially escalate to the nuclear level, as the 2015 study suggests. However, it is equally likely to remain confined to conventional and space warfare, for terrestrial territorial gains. The study also ignores the fact that a two-front war against India will be a function of the common objectives pursued by China and Pakistan against India, and vice versa. An inextricable link between space, nuclear and conventional deterrence and warfighting strategies is limited and conditional, if not tenuous.

According to Narang’s assessment, India lacks an “advantage” in the two conflict dyads. However, what India needs primarily is not an advantage but parity (especially if Pakistan tests its own KEW), which will enable it to militarily balance the collaborative space power of the People’s Republic of China (PRC) and Pakistan. Due to the vulnerabilities created by the two-front ASAT challenge and the absence of a robust capability, let alone a distinct advantage, India will need a triadic ground-, air- and sea-launched KEW capability to maintain a credible space deterrent. As one important study observed, “Though its [India’s] space assets are smaller than those of the other major powers they are not insignificant. At the least they may need to be protected against the direct and indirect consequences of actions taken by the other space powers.”[10] Former Indian National Security Adviser Shiv Shankar Menon, alluding to the differential in strength recently, observed, “The basic reason is the power gap between the two [China and India]…”[11] Consequently, creating a triad-based KEW capability assumes considerable importance, since it creates mutual risks and threats. In the event of deterrence breakdown, it gives New Delhi the option to escalate during the course of a military confrontation.

American strategic studies scholar Ashley J. Tellis argues, “India’s ASAT test was perhaps necessary, but it will not suffice to protect India’s space assets during any major conflict with China.”[12] While this is a valid point, Tellis overlooks the fact that India does not have kinetic capabilities that can be launched from diverse platforms, which can boost flexibility and offer redundancy to the extent that adversaries will need to contend with a larger “menu” of targets. Thus, it provides a diverse array of hard-kill capabilities. A kinetic ASAT capability may be a last-resort weapon, as Tellis correctly asserts, but the 27 March 2019 test was only a ground-launched projectile adapted from a missile-defence interceptor and launched from the Interim Test Range (ITR). The test is, therefore, insufficient to sustain the Indian space deterrent posture vis-à-vis China, and additional tests from sea- and air-launched platforms are required. The Peoples Liberation Army Navy (PLAN) has undertaken a prototype laser weapon test, which is a Directed Energy Weapon (DEW) from presumably surface vessel.[13] Beijing has also invited bids for a nuclear powered ship-breaking vessel,[14] which could potentially enable the PLAN to develop nuclear-powered aircraft carriers serving as future platforms for the employment DEWs such as laser weapons against space targets.[15]

Indeed, Tellis’ claim that India’s ASAT amounted to an “incomplete success” is accurate, but not for the reasons he believes. His prescription specifically requires moving away from “debris-generating kinetic tests” and emulating China in developing non-kinetic capabilities.[16] On the contrary, the March test was incomplete because it did not fully test India’s kinetic capabilities from diverse platforms. KEW tests from diverse platforms will make India’s space deterrent more robust, inject caution into India’s adversaries, and create shared risks essential to sustaining credible deterrence. Tellis also leaves unexplained why Beijing, despite the debris-related risks that accompany any direct ascent KEW tests, pursues the acquisition of KEWs such as the SC-19, DN-1 and DN-3, which are capable of striking Indian space assets in GEO in parallel with its development and deployment of DEWs and other non-kinetic counter space capabilities.

The point to underline here is that India will need standalone kinetic capabilities as well as non-kinetic means to deter China. India’s Defence Research and Development Organisation (DRDO) appears to have foreclosed the option of further kinetic tests, with G. Satish Reddy declaring, “Though we tested the interceptor missile for an altitude below 300 km as a responsible nation after multiple simulations, it has the technical capability to go beyond 1,000 km. That will cover most of the orbiting satellites in LEO. For the same purpose we don’t need more tests.”[17] This misses the point about survivability, redundancy and flexibility, which can only be assured if additional tests are conducted from sea- and air-launched platforms. However, the DRDO chief’s statement is revealing in terms of the altitude of the test, which is important inasmuch as future tests must not be conducted beyond an altitude of 300 km, to prevent the creation of longer-lasting space debris. In 2012, the DRDO declared that simulated electronic tests were sufficient to meet India’s ASAT requirements.[18] However, the Modi government decided to carry out an actual test, rejecting the view that simulated tests were sufficient. For a credible space-deterrent posture, which Reddy conceded was important, a diversified kinetic capability appears not integral to that effort. Moreover, taking into account the two-front ASAT challenge, it would be unwise to forego the additional tests required for establishing a KEW triad.

A 2017 Indian study recommended the creation of a KEW triad, albeit without explaining the military-operational and technical reasons for the same.[19] Another analysis draws attention to the vulnerability of Indian satellites—radar, earth-observation (EO), cartographic and navigation satellites—particularly in low-earth orbit (LEO), where a large number of India’s satellites are concentrated. The study proposes several soft-kill capabilities, including counter-measures such as building a more robust Space Surveillance Network (SSN), hardening satellites and making them stealthier to avoid detection, thus reducing their vulnerability to Chinese KEWs.[20] It further recommends developing resilient satellites against electronic countermeasures and geographically spread static and mobile telemetry, tracking and command (TTC) facilities as critical mitigatory measures against soft-kill attacks. However, the study precludes the development of whole categories of weapons. For instance, hard-kill weapons or KEWs have not been included in the mix of capabilities India should possess. Interestingly, the paper does acknowledge that pure soft-kill capabilities in the form of cyber weapons, electronic-warfare capabilities and DEWs are insufficient.[21] As a solution, however, it recommends policy, normative and legal restraints against space weapons, instead of R&D or the deployment of space weapons.[22]

Distant Indian space targets, such as the Indian Regional Navigation Spacecraft System (IRNSS), in geosynchronous orbit (GEO), are difficult to strike kinetically. However, China does possess the capabilities for doing so.[23] In May 2013, China tested the SC-19 ASAT system that can hit targets in GEO.[24] Its successor missile, the DN-3, too is ASAT capable and is likely a ballistic missile interceptor meant for intercepting targets in LEO.[25] Both these capabilities represent significant and critical advances in hit-to-kill kinetic capabilities to strike space assets well beyond LEO. In 2010, 2013 and 2014, China conducted ASAT non-debris-generating tests using adapted land-based ballistic missile interceptors.[26] Co-orbital ASATs are another arrow in China’s space quiver. In 2008, the BX-1, a miniature imaging satellite was deployed in-orbit close to its mother satellite and passed within 45 km of the International Space Station (ISS). While this is speculative, the BX-1 was likely released from a spring-loaded device, which does not conclusively prove counter-space capability but does establish China’s ability to undertake a co-orbital ASAT.[27] As a follow-up to their BX-1 test in 2008, China launched the SJ-12 satellite, which is believed to possess counter-space capabilities such as jamming.[28] In 2011, the SJ-12 undertook a close manoeuvre to test docking capabilities, possibly as a test run for the actual docking of the Shenzhou capsule with the Tiangong-1 space station. In 2013, China tested a robotic arm, which grabbed one satellite from another. These tests demonstrate China's ability to conduct orbital proximity operations, allowing it to execute microwave attacks against enemy satellite systems. While of the technologies and capabilities tested by China are seemingly for civilian applications, given the dual nature of space technology, they are potentially applicable in the military arena.

Thus, China have developed a whole slew of kinetic capabilities that can target Indian satellites in LEO, sun-synchronous orbit (SSO), medium-earth orbit (MEO) and GEO (See Figure 1). These include cyber weapons to attack space assets, co-orbital attack capabilities, as well as kinetic earth-to-space and air-to-space kinetic capabilities.[29] In light of China’s expertise, India cannot afford to confine itself to passive means of defending against Chinese space assets and infrastructure.

#### Orbital slots are appropriated because they violate freedom of use.

Cahill 2k Susan Cahill 2000 “Give me My Space” <https://heinonline.org/HOL/Page?handle=hein.journals/wisint19&div=17&g_sent=1&casa_token=&collection=journals> SM

The non-appropriation principle in Article II of the Outer Space Treaty establishes that space "is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."" Appropriation is the exercise of control over property." This principle was adopted to implement the freedom of use principle, as appropriation undermines freedom of use.' Appropriation of outer space, therefore, is "the exercise of exclusive control or exclusive use" with a sense of permanence, which limits other nations' access to it.2

One view is that orbital allotments do not constitute appropriation because the exclusivity requirement is not met." According to this perspective, duration of the occupation is not permanent, and satellites can operate within the same area of outer space. 4 Pursuant to this view, each nation is offered an equal chance to be the first one to obtain an orbital position." Therefore, all states are treated equally because the basis for use is the same for each.' However, this cannot create actual equity because it fails to empower a state to make use of its rights."

C. THE PRINCIPLE OF EQUITY

As a general rule, there can be no exclusive title to specific frequencies." Although the concept of equitable access is recognized in several international space agreements, it is never defined." However, there is general acceptance that equitable does not mean equal. " ' Arguably, the word "access" presupposes the technical ability to reach the geostationary orbit.6" It does not indicate ownership, but simply implies admittance to the orbit.6' In practice, equity analysis is fact-sensitive. "Although the Convention specifies certain factors relevant to equitable access, it does not state that they are intended to be exclusive.""

Other factors to be considered include the ability to use the resource and the needs of current users.6 The needs of current users must be taken into account because "[t]he current users of the orbit/spectrum resource undertook that use, and the great expense underlying it, with an expectation of protection by the existing ITU regulatory regime."' ' Thus, "notions of fairness inherent in the concept of equity require that those users be accommodated in a guarantee of equitable access."' According to developing nations, "ability should be viewed as relevant to equitable access only to the extent that it pertains to the time of use."' It would then become acceptable to give a present guarantee for future access, thereby assuring equitable access, while allowing current use by another country capable of utilizing the slot." Arguably, the principles of the OST appear to support this contention, as it seems to indicate that no permanent priority should be given to any country for access and use of a particular orbit."

#### AND, solves Chinese A2AD expansion.

Stephen Biddle 16. Professor of Political Science and International Affairs at George Washington University and Adjunct Senior Fellow for Defense Policy at the Council on Foreign Relations; and Ivan Oelrich, served as Vice President for the Strategic Security Program at the Federation of American Scientists and is Adjunct Professor of International Affairs at George Washington University, Summer 2016, “Future Warfare in the Western Pacific: Chinese Antiaccess/Area Denial, U.S. AirSea Battle, and Command of the Commons in East Asia,” International Security, Vol. 41, No. 1, p. 7-48

The United States must also be able to neutralize any satellite-based sea surveillance systems China may deploy. Neutralization may be possible with cyber or other soft-kill approaches, but it will probably be necessary to maintain a hard-kill ASAT capability for this purpose. If Chinese space-based radars are allowed to function, continued growth of Chinese long-range missile capabilities will eventually enable an A2/AD system that really could threaten targets out to the Second Island Chain. A U.S. capability to deny this is thus critical if Chinese A2/AD range is to be constrained to the limits presented above.

#### Chinese A2AD collapses global FON norms.

Prashanth Parameswaran 15. Visiting Fellow at the ASEAN Studies Center at American University, Ph.D. Candidate and Provost Fellow at the Fletcher School of. Law and Diplomacy at Tufts University, “US Commander Warns China Against ‘Revising’ International Law in the South China Sea”, The Diplomat, 10-9, http://thediplomat.com/2015/10/us-commander-warns-china-against-revising-international-law-in-the-south-china-sea/

Swift was referring to manifestations of Chinese assertiveness in the South China Sea over the past few years, including the erection of an Air Defense Identification Zone (ADIZ) in the East China Sea and the construction of artificial islands. If such efforts went uncontested, Swift argued in his speech to the Royal Australian Navy Seapower Conference, seen by The Diplomat, it would be a setback for global norms.

“If even one of these restrictions were successful, it would be a major blow to the international rules-based system with ramifications well beyond the maritime domain,” Swift said.

Restricting freedoms, values and rights that all actors enjoy in the international rules-based system through ‘might makes right’ approaches, Swift argued, would undermine global economic prosperity and return us to a world of mercantilism and protectionism that benefits only a handful of powerful states.

“If we are not willing to commit to resolve these differences peacefully, leveraging the tools of the international rules-based system that has served us so well, for so long, in an multilateral, inclusive way; then are we willing to accept the likelihood that imposed solutions to these national differences at sea, will seek us out in our supposed sanctuaries ashore?” Swift said.

#### Extinction.

Dr. James Kraska 11. Professor in the Stockton Center for the Study of International Law at the U.S. Naval War College, Maritime Power and the Law of the Sea: Expeditionary Operations in World Politics, Oxford University Press, Google Books

What do the issues of global politics and grand strategy have to do with oceans policy? Oceans policy should be connected to and serve grand strategy, which should be implemented by national strategy. The United States and its friends and allies face a common set of strategic risks and threats in the global system, and a policy for the legal order of the oceans should be pursued that meets the major challenges of the day. In some respects, U.S. oceans policy has been at the forefront of reducing military risk to the United States. The U.S.-sponsored post- 9/11 counter-terrorism initiatives introduced by the United States and other nations at the International Maritime Organization reflect this strategic purpose. Amendments adopted in the fall of 2005 to the 1988 Convention on the Suppression of Unlawful Acts against the Safety of Maritime Navigation tighten rules to counter maritime terrorism and the transport of weapons of mass destruction on a ship. Similarly, the International Shipping and Port Facility Security (ISPS) Code, which amends the 1974 Safety of Life at Sea Convention, established tougher standards for seaside and vessel security, reducing the vulnerability of the maritime system to terrorist attack. At the same time, however, the United States has been surprisingly lax in maintaining awareness of military risks posed by peer state rivals, and the relationship between grand strategy and oceans policy. What are the greatest military risks in the international system?

First, the greatest military threat to a stable order comes from China, which is rising on a wave of economic, scientific, and military power. Success in these spheres is producing political power for the first time, creating in Beijing a heady atmosphere of arrival. China is a trendsetter in Asia, and is marketing its illiberal perspective on oceans policy, both in the Pacific region and at the IMO. Following behind China, nations such as Brazil and Iran are becoming dominant in their respective geographic and political spheres. Brazil is filling a power vacuum on the continent of South America; Iran is filling a void created by the toppling of Saddam Hussein and subsequent civil war in Iraq. Second, a resurgent autocratic Russia could further destabilize Europe. Moscow’s heavy hand has frightened the states on its western border, and encumbered better relations with NATO and the EU. Empowered with energy wealth to rebuild its military forces, Russia still suffers from a decayed infrastructure and an unhealthy and declining population base. But Moscow aspires to be a naval power once again, so there may be opportunity to engage with Russia more effectively. The United States has more in common with Russia on oceans policy than any other issue, and the two states worked closely to achieve the navigational regimes in UNCLOS. But instead of working in tandem with Moscow at the IMO, the United States and Russia have been more inclined to butt heads. For the United States, the goal is to reassure European allies and curry favor with the EU nations; for Russia, the objective has been to myopically define its foreign policy in terms of opposition to whatever the U.S. is promoting. Both nations share essential interests in a liberal order of the oceans, and should work together closely to maintain and stabilize the system of rules in UNCLOS that they created.

Third, the Middle East is under a grave threat from an aggressive and dedicated assault by an irreconcilable wing of Islam, funded by radical Shiites and Sunnis. The extremists seek to attack the West in order to weaken its resolve and dilute its institutions, destroy Israel, and impose a caliphate dictatorship throughout the Middle East. The states in the region — Syria, Iran, Egypt, Saudi Arabia — are caught in the crosshairs, and any one of them could erupt into chaos, anarchy, or war. Whereas Egypt and Saudi Arabia care so much about stability that they stamp out all dissent, breeding a seething anger that could explode, Syria and Iran are breeding instability by conducting secret, irregular wars through proxy forces throughout the Levant and beyond. Iran’s “split personality” between the more professional Iranian Navy on the one hand and the Iranian Revolutionary Guard Navy (IRGCN) on the other, keeps the Persian Gulf in a constant state of high tension.

Fourth, there are a growing number of rogue regimes eager to acquire weapons of mass destruction, mass murder, and mass disruption. These regimes, including North Korea, are developing chemical, biological, and nuclear weapons in order to limit the flexibility of the democratic states to challenge them, to deter neighborhood policing by the United States and its allies, and to be able to impose their will on their neighbors. Iran is the most unpredictable nation in the Middle East, and Tehran has exported instability into both Gaza and Lebanon.

Fifth, the Pakistan-Afghanistan problem has lit South Asia from the coast of Gwadar to the peaks of the Hindu Kush. Even more so than Egypt and Saudi Arabia, Pakistan teeters on anarchy, and it is not implausible to worry about the nation descending into a jihad autocracy. The Pakistani military and intelligence service are both essential partners in the fight against terrorism, as well as collaborators that are not entirely reliable. While Islamabad remains focused inward toward the continent, it also bristles at Delhi’s grip on the Indian Ocean. Pakistan, like its neighbor India, purports to restrict foreign military activities in its EEZ.

Finally — particularly relevant for this study — there is an emerging international governance system of pseudo-legality sustained by bureaucratic international elites and anti-American and anti-Western states, which weakens the democracies, “protects the vicious and the evil, and absorbs the energy of decent countries into endless maneuvers of utter impotence and dishonesty.” 29 In the maritime context, the tribulations of international law are exposed in the application of UNCLOS. The international law of the sea is pulled in so many different, even contradictory directions, by dissimilar domestic and international constituencies that it is becoming unmoored from its roots as a system for international peace and stability. As a global system, the law of the sea is becoming less coherent, not more. By working at cross-purposes to obfuscate international law of the sea in a bureaucratic web of contradictory transnational, foreign, and domestic rules, oceans law risks being an agent of disorder rather than order. 30

These six global threats are evolving in parallel and sometimes in synergistic coordination. American grand strategy should take into account the six threats; democratic states should implement a foreign policy that is designed to overmatch all of these challenges. As an adjunct of grand strategy, oceans policy should be attached to and promote the defeat of these six threats. Freedom of the seas, particularly in the EEZ, is a crucial element for meeting each of these challenges.

#### Indian ASATs solve Pakistani nuke buildup and Chinese preemptive strikes.

Chellaney 19 ― Brahma Chellaney, Professor of Strategic Studies at the Centre for Policy Research, Fellow at the Robert Bosch Academy, nonresident affiliate with the International Centre for the Study of Radicalization at King's College London, former Fellow at the Norwegian Nobel Institute, Ph.D. in international studies from Jawaharlal Nehru University, 2019. (“The looming specter of Asian space wars”, *Asian Review*, March 29th, 2019, Available Online at: [https://asia.nikkei.com/Opinion/The-looming-specter-of-Asian-space-wars Accessed 8-16-2019](https://asia.nikkei.com/Opinion/The-looming-specter-of-Asian-space-wars%20Accessed%208-16-2019))

The linkages between antisatellite, or ASAT, weapon technologies and ballistic missile defense systems, which can shoot down incoming missiles, underscore how innovations favor both offense and defense. Space wars are no longer just Hollywood fiction.

India's ASAT test is a reminder that the Asia-Pacific region is the hub of the growing space-war capabilities. The United States and Russia field extensive missile defense systems and boast a diverse range of ground-launched and directed-energy ASAT capabilities. China's ASAT weaponry is becoming more sophisticated, even as it aggressively seeks theater ballistic missile defenses.

Japan and South Korea are working with the U.S. separately to create missile defense systems. Although aimed at thwarting regional threats, these systems are interoperable with American missile defenses. Australia, for its part, participates in trilateral missile-defense consultations with the U.S. and Japan.

Space-based assets are critical not just for communications but also for imagery, navigation, weather forecasting, surveillance, interception, missile guidance and the delivery of precision munitions. Taking out such assets can ~~blind~~ an enemy.

India's successful "kill" of one of its own satellites with a missile -- confirmed by the U.S. Air Force Space Command -- has made it the fourth power, after the United States, Russia and China, to shoot down an object in space. Prime Minister Narendra Modi, facing a tight reelection race, made a rare televised address to announce India's entry into this exclusive club of nuclear-armed countries that can destroy a moving target in space.

India's technological leap is being seen internationally as a counter to China's growing ASAT capabilities, which include ground-based direct ascent missiles and lasers, which can ~~blind~~ or ~~disable~~ satellites.

The international development of ASAT capabilities mirrors the nuclear-weapons proliferation chain. Like nuclear weapons, the U.S. was the first to develop satellite-kill technologies, followed by the former Soviet Union. China, as in nuclear weapons, stepped into this realm much later, only to provoke India to follow suit.

The Indian test was clearly a warning shot across China's bow, although Modi claimed that it was not aimed against any country.

India finds itself boxed in by the deepening China-Pakistan strategic nexus. China has transferred, according to international evidence, technologies for weapons of mass destruction to Pakistan to help tie down India south of the Himalayas. Beijing currently is seeking to shield Pakistan even from international pressure to root out transnational terrorist groups that operate from its territory.

The Indian ASAT demonstration holds strategic implications also for Pakistan, which values nuclear weapons as an antidote to its conventional military inferiority and thus maintains a nuclear first-use doctrine against stronger India. By shielding it from retaliation, Pakistan's nuclear weapons enable its nurturing of armed jihadists as a force multiplier in its low-intensity proxy war by terror against India.

An ASAT capability, by potentially arming India with the means to shoot down incoming missiles, could erode Pakistan's nuclear deterrent. After all, an ASAT capability serves as a building block of a ballistic missile defense system.

However, China remains at the center of Indian security concerns. Without developing ASAT weaponry to help underpin deterrence, India risked encouraging China to go after Indian space-based assets early in a conflict.

In today's world, one side can impose its demands not necessarily by employing force but by building capabilities that can mount a coercive threat.

China's ASAT capabilities arguably hold the greatest significance for India, which has no security arrangements with another power and thus is on its own. Japan, South Korea and Australia, by contrast, are ensconced under the U.S. security umbrella. The U.S. and Russia, armed to their teeth, can cripple China's space-based assets if it dared to strike any of their satellites.