# 1NC Lex R5

## T

#### Interp: The affirmative must defend the ban of private actor appropriation of Outer Space - not a reduction.

#### Unjust means dialectically contrary to law – only ban does that.

The Law Dictionary, ND, Def of Unjust, URL: <https://thelawdictionary.org/unjust/#:~:text=Contrary%20to%20right%20and%20justice,conduct%20furnished%20by%20the%20laws>, KR

Contrary to right and justice, or to the enjoyment of his rights by another, or to the standards of conduct furnished by the laws.

#### Unjust means opposed to law.

FreeDictionary [TheFreeDictionary, Unjust, xx-xx-xxxx,https://legal-dictionary.thefreedictionary.com/Unjust, 12-17-2021 amrita]

**UNJUST.** That which is done against the perfect rights of another; that which **is against the established law**; that which is opposed to a law which is the test of right and wrong.

#### Violation: They defend a leasing- that’s not oppositional to the law because it means that there’s a world where the law would permit private appropriation.

1AC perhsing –

Pershing 19 [Abigail D. Pershing, J.D., Yale, “Interpreting the Outer Space Treaty’s Non-Appropriation Principle: Customary International Law from 1967 to Today,” 2019, *The Yale Journal of International Law*, Vol. 44, https://openyls.law.yale.edu/bitstream/handle/20.500.13051/6733/Pershing.pdf?sequence=2&isAllowed=y, EA]

B. A New Property Rights Proposal: Leasing Space

One promising proposal that does not appear to have received much attention in the literature is the concept of leasing space to nations, private individuals, or companies rather than allocating it as permanently-owned property. It appears that the only authors who have even tangentially considered the possibility of leasing property rights in space beyond rights to mineral extraction are Marcel Williams and G.S. Sachdeva. Williams’ writing is limited to a thought experiment in which he imagines renting out up to one percent of the moon’s surface. This property would be directly leased to national governments, which in turn would be vested with the power to sublease sections of this territory to private companies or individuals.134 This proposal is not elaborated any further and is left as a broad-strokes outline. The second mention of leasing or renting space comes from G.S. Sachdeva, who argues that a U.N. Space Superintendence Authority could grant leases to those able to pay.135 Yet this theory is limited to a discussion of renting property rights in particular orbits to allow for hovering geostationary space hotels and does not delve into questions of renting land on celestial bodies.

The concept of leasing outer space deserves greater consideration by space law scholars. This Section sketches a brief outline of how such a system might operate via an internationally-run space property rental system modeled on UNCLOS. Although UNCLOS itself is deeply problematic in its potentially devastating environmental consequences and negative impacts on indigenous peoples as it regulates deep-sea mining,136 the UNCLOS model may nonetheless be the best option for preserving non-space-faring nations’ rights with regard to outer space, given its success in providing developing nations with a voice in the regulation of the high seas and the seabed beyond national jurisdiction.137 It is worth noting that although very few scholars appear to have considered the possibility of renting space, several have examined the similarities between UNCLOS and space law.138 The approach advanced here differs from the conventional approach to this comparison in that it suggests that the international community move beyond merely authorizing nations or

#### Standards:

#### 1] Predictable Limits – there’s hundreds of other ways in which the affirmative can defend the restriction of private entities in Outer space – they can make some fines, etc, which makes it impossible for the negative to predict what process the affirmative is going to defend to mandate a ban of private actor appropriation of space. Our interp is the most predictable because it’s grounded in the topic wording.

#### 2] Topic ed – Bans are one of the most common and is most germane to the literature – increases the amount of ground and ability to have deep debates on the model which the majority of the literature is centered around as opposed to an irrelevant model that kills critical thinking abilities.

#### Topicality is a voting issue that should be evaluated through 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. No RVIs—it’s your burden to be fair and T—same reason you don’t win for answering inherency or putting defense on a disad.

## NC

#### The metaethic is practical reason. Prefer:

#### [1] Regress – Ethical theories must have a basis. We can always ask why we should follow the basis of a theory, so they aren’t morally binding because they don’t have a starting point. Practical reason solves – When we ask why we should follow reason, we demand a reason, which concedes to the authority of reason itself, so it’s the only thing we can follow

#### [2] Action Theory – Every action can be broken down to infinite amounts of movements, i.e. me moving my arm can be broken down to the infinite moments of every state my arm is in. Only reason can unify these movements because we use practical reason to achieve our goals, means all actions collapse to reason

#### Practical reason means we all have a unified perspective: What can be justified to me can be justified to everyone who is a practical reasoner. If I can conclude that 2+2 is 4, then I understand not only that I know 2+2 is 4, but that everyone around me can arrive at the same conclusion. These things are temporally consistent: I know that me adding two numbers now and taking that sum will not result in me adding the same two numbers in the future and getting a different sum. Our unified perspective does not change but rather stays consistent.

#### But, willing an action that violates the freedom of others is a contradiction: If I decide to kill someone, that action is not universalizable because that would justify other people killing me too. If I die, I cannot exercise my freedom to kill someone else. This is a contradiction: I both justify extending my freedom to kill others and limiting my own freedom.

#### Thus, the standard is respecting freedom.

#### Acquisition of property can never be unjust – to create rights violations, there must already be an owner of the property being violated, but that presupposes its appropriation by another entity.

Feser, (Edward Feser, 1-1-2005, accessed on 12-15-2021, Cambridge University Press, "THERE IS NO SUCH THING AS AN UNJUST INITIAL ACQUISITION | Social Philosophy and Policy | Cambridge Core", Edward C. Feser is an American philosopher. He is an Associate Professor of Philosophy at Pasadena City College in Pasadena, California. [https://www.cambridge.org/core/journals/social-philosophy-and-policy/article/abs/there-is-no-such-thing-as-an-unjust-initial-acquisition/5C744D6D5C525E711EC75F75BF7109D1)[brackets](https://www.cambridge.org/core/journals/social-philosophy-and-policy/article/abs/there-is-no-such-thing-as-an-unjust-initial-acquisition/5C744D6D5C525E711EC75F75BF7109D1)%5bbrackets) for gen lang]//phs st

There is a serious difficulty with this criticism of Nozick, however. It is just this: There is no such thing as an unjust initial acquisition of resources; therefore, there is no case to be made for redistributive taxation on the basis of alleged injustices in initial acquisition. This is, to be sure, a bold claim. Moreover, in making it, I contradict not only Nozick’s critics, but Nozick himself, who clearly thinks it is at least possible for there to be injustices in acquisition, whether or not there have in fact been any (or, more realistically, whether or not there have been enough such injustices to justify continual redistributive taxation for the purposes of rectifying them). But here is a case where Nozick has, I think, been too generous to the other side. Rather than attempt —unsatisfactorily, in the view of his critics—to meet the challenge to show that initial acquisition has not in general been unjust, he ought instead to have insisted that there is no such challenge to be met in the first place. Giving what I shall call “the basic argument” for this audacious claim will be the task of Section II of this essay. The argument is, I think, compelling, but by itself it leaves unexplained some widespread intu- itions to the effect that certain specific instances of initial acquisition are unjust and call forth as their remedy the application of a Lockean proviso, or are otherwise problematic. (A “Lockean proviso,” of course, is one that forbids initial acquisitions of resources when these acquisitions do not leave “enough and as good” in common for others.) Thus, Section III focuses on various considerations that tend to show how those intuitions are best explained in a way consistent with the argument of Section II. Section IV completes the task of accounting for the intuitions in question by considering how the thesis of self-ownership itself bears on the acqui- sition and use of property. Section V shows how the results of the previ- ous sections add up to a more satisfying defense of Nozickian property rights than the one given by Nozick himself, and considers some of the implications of this revised conception of initial acquisition for our under- standing of Nozick’s principles of transfer and rectification. II. The Basic Argument The reason there is no such thing as an unjust initial acquisition of resources is that there is no such thing as either a just or an unjust initial acquisition of resources. The concept of justice, that is to say, simply does not apply to initial acquisition. It applies only after initial acquisition has already taken place. In particular, it applies only to transfers of property (and derivatively, to the rectification of injustices in transfer). This, it seems to me, is a clear implication of the assumption (rightly) made by Nozick that external resources are initially unowned. Consider the following example. Suppose an individual A seeks to acquire some previously unowned resource R. For it to be the case that A commits an injustice in acquiring R, it would also have to be the case that there is some individual B (or perhaps a group of individuals) against whom A commits the injustice. But for B to have been wronged by A’s acquisi- tion of R, B would have to have had a rightful claim over R, a right to R. By hypothesis, however, B did not have a right to R, because no one had a right to it—it was unowned, after all. So B was not wronged and could not have been. In fact, the very first person who could conceivably be wronged by anyone’s use of R would be, not B, but A himself, since A is the first one to own R. Such a wrong would in the nature of the case be an injustice in transfer—in unjustly taking from A what is rightfully his—not in initial acquisition. The same thing, by extension, will be true of all unowned resources: it is only after some- one has initially acquired them that anyone could unjustly come to possess them, via unjust transfer. It is impossible, then, for there to be any injustices in initial acquisition.7

## CP

#### CP Text: Space faring nations should establish a multilateral agreement that restricts asteroid mining done by private entities except for on asteroid Kamo’oalewa.

#### Kamo’oalewa is NEO asteroid comprised of lunar material

Devlin 21 [Hannah Devlin is the Guardian's science correspondent, having previously been science editor of the Times. “Near-Earth asteroid is a fragment from the moon, say scientists.” November 11, 2021. https://www.theguardian.com/science/2021/nov/11/near-earth-asteroid-is-a-fragment-from-the-moon-say-scientists]

Scientists have identified what appears to be a small chunk of the moon that is tracking the Earth’s orbit around the Sun. The asteroid, named Kamo`oalewa, was discovered in 2016 but until now relatively little has been known about it. New observations suggest it could be a fragment from the moon that was thrown into space by an ancient lunar collision. Kamo`oalewa is one of Earth’s quasi-satellites, a category of asteroid that orbits the Sun, but remains relatively close to the planet – in this case about 9m miles away. Despite being close in astronomical terms, the asteroid is about the size of a ferris wheel and about 4m times fainter than the faintest star that can be seen with the naked eye. Consequently, the Earth’s most powerful telescopes are needed to make observations. Using the Large Binocular Telescope on Mount Graham in southern Arizona, astronomers found the spectrum of reflected light from Kamo`oalewa closely matched lunar rocks from Nasa’s Apollo missions, suggesting it originated from the moon. They had initially compared the light with that reflected off other near-Earth asteroids, but drawn a blank. “I looked through every near-Earth asteroid spectrum we had access to, and nothing matched,” said Ben Sharkey, a PhD student at the University of Arizona and the paper’s lead author. After missing the chance to observe Kamo`oalewa in April 2020 owing to a shutdown of the telescope during the coronavirus pandemic, the team found the final piece of the puzzle in 2021. “This spring, we got much needed follow-up observations and went, ‘Wow it is real,’” Sharkey said. “It’s easier to explain with the moon than other ideas.”

#### Space based solar power is being developed and transitions to 100% clean energy, but lunar regolith is key

O’Neill 13 [Ian O'Neill is a media relations specialist at NASA's Jet Propulsion Laboratory (JPL) in Southern California. Prior to joining JPL, he served as editor for the Astronomical Society of the Pacific‘s Mercury magazine and Mercury Online and contributed articles to a number of other publications, including Space.com, Space.com, Live Science, HISTORY.com, Scientific American. Ian holds a Ph.D in solar physics and a master's degree in planetary and space physics. “How to Turn the Moon Into a Giant Space Solar Power Hub.” December 3, 2013. https://www.space.com/23810-moon-luna-belt-solar-power-idea.html]

When it comes to space and energy, we need to think big. That's what one Japanese company is doing — and they're reaching for the moon, literally. The best thing about the moon is that one lunar hemisphere is constantly bathed in sunlight (except for the occasional eclipse), so using solar arrays to generate power may not seem like such a stretch. Take China's recently-launched Chang'e 3 Yutu rover for example, it's solar powered. Also, Apollo astronauts set up solar-powered experiments on the lunar regolith. But how about wrapping the moon's equator in a 250 mile wide band of solar panels and beaming the power generated back to Earth? That's exactly what Shimizu Corporation is proposing and they reckon their concept could harness a steady stream of 13,000 terawatts of power. According to Business Insider, "the total installed electricity generation summer capacity in the United States was 1,050.9 gigawatts." Such a vast energy resource could be transformative for our civilization. As Obi-Wan might say: "That's no moon. It's a space (solar power) station." "A shift from economical use of limited resources to the unlimited use of clean energy is the ultimate dream of all mankind," says the company's website. "The LUNA RING, our lunar solar power generation concept, translates this dream into reality through ingenious ideas coupled with advanced space technologies." Indeed, advanced space technologies will be needed, not only to harvest solar energy and efficiently beam it back to Earth, but its very construction will require several leaps in robotic technology development. Also, this mother of all engineering tasks will need to see some significant changes in international space treaties before it sees light of day. Resembling a moon born from science fiction, the LUNA RING is just that, a ring around the moon. The ring, stretching 6,800 miles around the moon's circumference, will be constructed by robots that will "perform various tasks on the lunar surface, including ground leveling and excavation of hard bottom strata." The entire project will be overseen by a team of humans while the bulk of the robotic tasks can be teleoperated from Earth. [Moon Base Visions: How to Build a Lunar Colony (Photos)] It’s all very well building a huge array of solar panels around the moon, but how would the power be sent to Earth? As our atmosphere is virtually transparent to microwaves and lasers, Shimizu envisages solar energy being fed through microwave/laser transmitters located around the Earth-facing side of the moon. As the moon orbits the Earth and the Earth rotates, international receiving stations will feed electricity grids with plentiful lunar solar power as the moon rises to when it sets. The designers are keen to point out that this is a green energy resource that could benefit the whole of mankind. What's more, when the infrastructure is set up, other resources can be exploited — such as mining for precious minerals and fabricating products from regolith. One could imagine an international consortium of nations and/or companies that buy a stake in the LUNA RING to aid its construction. Each partner would then have rights to construct receiving stations in their geographical location of choice, weaning us off polluting sources of power. Japan, which was hurt by the devastating Fukushima meltdown in 2011, is actively seeking out alternative power resources to wean itself off nuclear energy — it doesn't get more "alternative" than this.

**Warming causes extinction and guarantees every other impact**

Spratt and Dunplop 19, David Spratt [Research Director for Breakthrough National Centre for Climate Restoration, Melbourne, and co-author of Climate Code Red: The case for emergency action] & Ian Dunlop [member of the Club of Rome. Formerly an international oil, gas and coal industry executive, chairman of the Australian Coal Association, chief executive of the Australian Institute of Company Directors, and chair of the Australian Greenhouse Office Experts Group on Emissions Trading 1998-2000], “Existential climate-related security risk: A scenario approach,” Breakthrough - National Centre for Climate Restoration, May 2019, pg. 8-10, beckert. Brackets in original text

2020–2030: Policy-makers fail to act on evidence that the current ​Paris Agreement path — in which global human-caused greenhouse emissions do not peak until 2030 — will lock in at least 3°C of warming. The case for a global, climate-emergency mobilisation of labour and resources to build a zero-emission economy and carbon drawdown in order to have a realistic chance of keeping warming well below 2°C is politely ignored. As projected by Xu and Ramanathan, by 2030 carbon dioxide levels have reached 437 parts per million — which is unprecedented in the last 20 million years — and warming reaches 1.6°C.18 2030–2050: Emissions peak in 2030, and start to fall consistent with an 80 percent reduction in fossil-fuel energy intensity by 2100 compared to 2010 energy intensity. This leads to warming of 2.4°C by 2050, consistent with the Xu and Ramanathan “baseline-fast” scenario.19 However, another 0.6°C of warming occurs — taking the total to 3°C by 2050 — due to the activation of a number of carbon-cycle feedbacks and higher levels of ice albedo and cloud feedbacks than current models assume. [It should be noted that this is far from an extreme scenario: the low-probability, high-impact warming (five percent probability) can exceed 3.5–4°C by 2050 in the Xu and Ramanathan scheme.] 2050: By 2050, there is broad scientific acceptance that system tipping-points for the West Antarctic Ice Sheet and a sea-ice-free Arctic summer were passed well before 1.5°C of warming, for the Greenland Ice Sheet well before 2°C, and for widespread permafrost loss and large-scale Amazon drought and dieback by 2.5°C. The “**hothouse Earth**” scenario has been realised, and Earth is headed for another degree or more of warming, especially since human greenhouse emissions are still significant.20 While sea levels have risen 0.5 metres by 2050, the increase may be 2–3 metres by 2100, and it is understood from historical analogues that seas may eventually rise by more than 25 metres. Thirty-five percent of the global land area, and 55 percent of the global population, are subject to more than 20 days a year of **lethal heat** conditions, beyond the threshold of human survivability. The destabilisation of the Jet Stream has very significantly affected the intensity and geographical distribution of the Asian and West African monsoons and, together with the further slowing of the Gulf Stream, is impinging on life support systems in Europe. North America suffers from devastating weather extremes including wildfires, heatwaves, drought and inundation. The summer monsoons in China have failed, and water flows into the great rivers of Asia are severely reduced by the loss of more than one-third of the Himalayan ice sheet. Glacial loss reaches 70 percent in the Andes, and rainfall in Mexico and central America falls by half. Semi-permanent El Nino conditions prevail. Aridification emerges over more than 30 percent of the world’s land surface. Desertification is severe in southern Africa, the southern Mediterranean, west Asia, the Middle East, inland Australia and across the south-western United States. Impacts: A number of **ecosystems collapse**, including coral reef systems, the Amazon rainforest and in the Arctic. Some poorer nations and regions, which lack capacity to provide artificially-cooled environments for their populations, **become unviable**. Deadly heat conditions persist for more than 100 days per year in West Africa, tropical South America, the Middle East and South-East Asia, contributing to **more than a billion people being displaced** from the tropical zone. **Water availability decreases sharply** in the most affected regions at lower latitudes (dry tropics and subtropics), affecting about **two billion** people worldwide. Agriculture becomes nonviable in the dry subtropics. Most regions in the world see a significant drop in food production and increasing numbers of extreme weather events, including heat waves, floods and storms. Food production is inadequate to feed the global population and food prices skyrocket, as a consequence of a one-fifth decline in crop yields, a decline in the nutrition content of food crops, a catastrophic decline in insect populations, desertification, monsoon failure and chronic water shortages, and conditions too hot for human habitation in significant food-growing regions. The lower reaches of the agriculturally-important river deltas such as the Mekong, Ganges and Nile are inundated, and significant sectors of some of the world’s most populous cities — including Chennai, Mumbai, Jakarta, Guangzhou, Tianjin, Hong Kong, Ho Chi Minh City, Shanghai, Lagos, Bangkok and Manila — are abandoned. Some small islands become uninhabitable. Ten percent of Bangladesh is inundated, displacing 15 million people. Even for 2°C of warming, more than a billion people may need to be relocated and In high-end scenarios, the scale of destruction is beyond our capacity to model, with a **high likelihood of human civilisation coming to an end**.21 National security consequences: For pragmatic reasons associated with providing only a sketch of this scenario, we take the conclusion of the ​Age of Consequences ‘Severe’ 3°C scenario developed by a group of senior US national-security figures in 2007 as appropriate for our scenario too: Massive nonlinear events in the global environment give rise to ​massive nonlinear societal events.​ In this scenario, nations around the world will be ​overwhelmed by the scale of change and pernicious challenges, such as pandemic disease. The internal cohesion of nations will be under great stress, **including in the United States**, both as a result of a dramatic rise in migration and changes in agricultural patterns and water availability. The flooding of coastal communities around the world, especially in the Netherlands, the United States, South Asia, and China, has the potential to challenge regional and even national identities.​ **Armed conflict** between nations over resources, such as the Nile and its tributaries, is likely and **nuclear war** is possible. The social consequences range from increased religious fervor to ​outright chaos.​ In this scenario, climate change provokes ​a permanent shift in the relationship of humankind to nature​’.22 (emphasis added) DISCUSSION This scenario provides a glimpse into a world of “outright chaos” on a path to the end of human civilisation and modern society as we have known it, in which the challenges to global security are simply overwhelming and political panic becomes the norm. Yet the world is currently completely unprepared to envisage, and even less deal with, the consequences of catastrophic climate change.23 What can be done to avoid such a probable but catastrophic future? It is clear from our preliminary scenario that dramatic action is required this decade if the “hothouse Earth” scenario is to be avoided. To reduce this risk and protect human civilisation, a massive global mobilisation of resources is needed in the coming decade to build a zero-emissions industrial system and set in train the restoration of a safe climate. This would be akin in scale to the World War II emergency mobilisation. There is an increasing awareness that such a response is now necessary. Prof. Kevin Anderson makes the case for a Marshall Plan-style construction of zero-carbon-dioxide energy supply and major electrification to build a zero-carbon industrial strategy by “a shift in productive capacity of society akin to that in World War II”.24 Others have warned that “**only a drastic, economy-wide makeover within the next decade**, consistent with limiting warming to 1.5°C”, would avoid the transition of the Earth System to the Pliocene-like conditions that prevailed 3-3.3 million years ago, when temperatures were ~3°C and sea levels 25 metres higher.25 It should be noted here that the 1.5° goal is not safe for a number of Earth System elements, including Arctic sea-ice, West Antarctica and coral reefs.

#### If they try to shift out of the counterplan, it proves the abuse on T – means that they can always change their aff to solve for any disadvantages and it’s impossible for me to negate.

#### Yes PICs – the Hickman card is specific to the OST which they aren’t defending and the evidence only isolates US and China drawing outa s a reason for elgitmacy to fail – this also supercharges circumvention because any risk the aff could fail is a reason why there would be circumvention

The decision of the United States or China to withdraw from the OST would have far greater implications for the survival of the international space regime than the same decision by Bangladesh, Burkina Faso, or Papua New Guinea—the equality of states under international law remains nothing more than a useful fiction.

## CP

#### Counterplan text: States should establish a hotline to reduce miscalculation in space operations

Erwin 21

Sandra Erwin, [Senior staff writer; Writes about military space programs, policy, technology and the industry that supports this sector; She has covered the military, the Pentagon, Congress and the defense industry for nearly two decades as editor of NDIA’s National Defense Magazine and Pentagon correspondent for Real Clear Defense], 3 November 2021, “One way to help prevent wars in space? Military hotlines with Russia and China”, [https://spacenews.com/one-way-to-help-prevent-wars-in-space-military-hotlines-with-russia-and-china //](https://spacenews.com/one-way-to-help-prevent-wars-in-space-military-hotlines-with-russia-and-china%20//) AK

WASHINGTON — Hotlines between heads of states have long been established to reduce the risk that an accident or miscalculation might trigger a nuclear war. During recent U.S. military operations in the airspace above Syria, a hotline was set up with Russia to ensure safety of flight. With space now considered a domain of war, hotlines between U.S. and foreign rivals might be worth contemplating, said Lt. Gen. B. Chance Saltzman, U.S. Space Force deputy chief of space operations for operations, cyber and nuclear. Before joining the Space Force, Saltzman led air campaigns at U.S. Air Forces Central Command in the Middle East. “We had a hotline to the Russians because we were very concerned that a miscommunication with aircraft flying in close proximity in Syria would lead to a problem,” he said Nov. 3 during a conference call with U.S. and European reporters. “I don’t see any reason why a similar approach couldn’t work for the space domain,” Saltzman said. Saltzman is in Europe this week visiting allies. He said many of the conversations were about the “strategic competition” that is unfolding in the space domain between the U.S., China and Russia and the “lessons learned from history about miscommunication,” he said. During the air campaign over Syria, “the hotline that we used was to make as many of our operations as transparent as possible and attempt to avoid those miscommunications.” The risk of a mischaracterizing what any country is doing in space is even greater than in the air because objects in orbit are “hard to see,” he said. A civilian satellite conducting surveillance, for example, could be mistaken for a hostile counterspace weapon. “In space we literally can’t use our visual reference points. We have to rely on radar. We have to rely on telescopes, and that creates a level of uncertainty.” If there was a hotline, “at least we would have a discussion before we draw the wrong conclusions. And we currently don’t have that capability. But I think the idea merits a full scale discussion.” Saltzman on Nov. 3 gave a keynote speech at the Global Milsatcom 2021 conference in London. He said one of the themes was the desire for greater cooperation on space security. “Establishing responsible norms and behaviors is really a global concern. No one nation can establish those independently, and there’s so much shared capacity that we could leverage.” He said the United States remains “the most capable spacefaring nation in terms of the capabilities that we have on orbit.” But China poses a major challenge. “They can see that if they can take some of those capabilities from us, they can shift the tables in terms of of that strategic advantage,” Saltzman added. “And the most significant challenge isn’t any one system. It’s really the pace at which they’re developing all their systems. It’s such a broad array of counterspace capabilities that they’re pursuing and high end technologies, that what’s most concerning is just the speed at which they are going from ‘good idea’ to full scale capability that’s being demonstrated on orbit.” For the United States, “our challenge is going to be matching that pace, making sure that we’re paying attention, keeping good situational awareness of their developments.”

#### Solves advnatage 2 – there’s no msicalc from arms races since they can communicate with each toher whci prevents sitinerpretaiton

## DA

#### The plan requires clarifying international space law---causes strategic bargaining to extract concessions

Alexander William Salter 16, Assistant Professor of Economics, Rawls College of Business, Texas Tech University, "SPACE DEBRIS: A LAW AND ECONOMICS ANALYSIS OF THE ORBITAL COMMONS", 19 STAN. TECH. L. REV. 221 (2016), https://law.stanford.edu/wp-content/uploads/2017/11/19-2-2-salter-final\_0.pdf

V. MITIGATION VS. REMOVAL

Relying on international law to create an environment conducive to space debris removal initially seems promising. The Virginia school of political economy has convincingly shown the importance of political-legal institutions in creating the incentives that determine whether those who act within those institutions behave cooperatively or predatorily.47 In the context of space debris, the role of nation-states, or their space agencies, would be to create an international legal framework that clearly specifies the rules that will govern space debris removal and the interactions in space more generally. The certainty afforded by clear and nondiscriminatory48 rules would enable the parties of the space debris “social contract” to use efficient strategies for coping with space debris. However, this ideal result is, in practice, far from certain. To borrow a concept from Buchanan and Tullock’s framework,49 the costs of amending the rules in the case of international space law are exceptionally high. Although a social contract is beneficial in that it prevents stronger nation-states from imposing their will on weaker nation-states, it also creates incentives for the main spacefaring nations to block reforms that are overall welfare-enhancing but that do not sufficiently or directly benefit the stronger nations.

The 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (more commonly known as the Outer Space Treaty) is the foundation for current international space law.50 All major spacefaring nations are signatories. Article VIII of this treaty is the largest legal barrier to space debris removal efforts. This article stipulates that parties to the treaty retain jurisdiction over objects they launch into space, whether in orbit or on a celestial body such as the Moon. This article means that American organizations, whether private firms or the government, cannot remove pieces of Chinese or Russian debris without the permission of their respective governments. Perhaps contrary to intuition, consent will probably not be easy to secure.

A major difficulty lies in the realization that much debris is valuable scrap material that is already in orbit. A significant fraction of the costs associated with putting spacecraft in orbit comes from escaping Earth’s gravity well. The presence of valuable material already in space can justifiably be claimed as a valuable resource for repairs to current spacecraft and eventual manufacturing in space. As an example, approximately 1,000 tons of aluminum orbit as debris from the upper stages of launch vehicles alone. Launching those materials into orbit could cost between $5 billion and $10 billion and would take several years.51 Another difficulty lies in the fact that no definition of space debris is currently accepted internationally. This could prove problematic for removal efforts, if there is disagreement as to whether a given object is useless space junk, or a potentially useful space asset. Although this ambiguity may appear purely semantic, resolving it does pose some legal difficulties. Doing so would require consensus among the spacefaring nations. The negotiation process for obtaining consent would be costly.

Less obvious, but still important, is the 1972 Convention on International Liability for Damage Caused by Space Objects, normally referred to as the Liability Convention. The Liability Convention expanded on the issue of liability in Article VII of the Outer Space Treaty. Under the Liability Convention, any government “shall be absolutely liable to pay compensation for damage caused by its space objects on the surface of the Earth or to aircraft, and liable for damage due to its faults in space.”52 In other words, if a US party attempts to remove debris and accidentally damages another nation’s space objects, the US government would be liable for damages. More generally, because launching states would bear costs associated with accidents during debris removal, those states may be unwilling to participate in or permit such efforts. In theory, insurance can partly remediate the costs, but that remediation would still make debris removal engagement less appealing.

A global effort to remediate debris would, by necessity, involve the three major spacefaring nations: the United States, Russia, and China.53 However, any effort would also require—at a minimum—a significant clarification and—at most —a complete overhaul of existing space law.54 One cannot assume that parties to the necessary political bargains would limit parleying to space-related issues. Agreements between sovereign nation-states must be self-enforcing.55 To secure consent, various parties to the change in the international legal-institutional framework may bargain strategically and may hold out for unrelated concessions as a way of maximizing private surplus. The costs, especially the decision-making costs, of changing the legal framework to secure a global response to a global commons problem are potentially quite high.

#### Russia uses negotiations to push the PPWT---erodes US space dominance---unilat solves

Michael Listner 18, JD, Regent University School of Law, the founder and principal of the legal and policy think-tank/consultation firm Space Law and Policy Solutions, Sept 17 2018, "The art of lawfare and the real war in outer space", The Space Review, www.thespacereview.com/article/3571/1

A battle for primacy in outer space took place on August 14, 2018, among the Russian Federation, the United States, and, indirectly, the People’s Republic of China. This battle did not involve the exotic technology of science fiction, antisatellite weapons (ASATs), or the incapacitation of satellites; it was not part of a hot war and did not even occur in outer space. Rather, it took place in the halls of the Conference of Disarmament in Geneva, Switzerland, and concerned the interdiction of the hypothetical deployment of instrumentalities of a hot war in outer space. The carefully orchestrated arena for this battle by the proponents of banning so-called space weapons involved methodologies, institutions, and agents of international law but was undermined by a vigorous counterattack by the United States using the same forum and suite of instruments so skillfully levied against it.1 This battle, of course, is not a single instance but the latest skirmish of a much larger conflict involving real war in space.

There’s been significant attention—and overstatem­ent— about the effect of a proposed Space Force by the United States, including an arms race and dominance as articulated by the United States,2 yet little attention has been given to the contest that continues to be fought over outer space using the tools of international law and policy, both of which are instruments of “lawfare.” Maj. General Charles N. Dunlap, Jr. (retired)3 first defined lawfare in the paper “Law and Military Interventions: Preserving Humanitarian Values in 21st Conflicts,” as “a method of warfare where law is used as a means of realizing a military objective.”4 This definition can be expanded to the use of hard law, soft law, and non-governmental organizations and institutions within the international arena to achieve a national objective and geopolitical end that would otherwise require the use of hard power. As observed by General Dunlap, lawfare imputes the teachings of Sun Tzu in particular this teaching: “The supreme art of war is to subdue the enemy without fighting.”5

Lawfare is not a new concept and has been used in many domains, but the tools brought to bear have become more prolific, and the domain of outer space has been and continues to be a theater where it is applied. The earliest example of lawfare (even though the term was not yet coined) in outer space occurred pre-Sputnik with Soviet Union attempting to use customary law to make claims of sovereignty extending beyond the atmosphere to the space above its territory. This claim was preempted by the launch of Sputnik 1 and the act of the satellite flying over the territory of other nations.6 The Eisenhower Administration saw this as an opportunity to meet a national space policy goal and likewise used customary law as an implement of lawfare and successfully created the principle of free access to outer space, which it utilized for photoreconnaissance activities in lieu of overflights of another nation’s sovereign airspace.7 The Soviet Union unsuccessfully attempted to defeat this move using lawfare in the United Nations through a proposal that would have prohibited the use of outer space for the purpose of intelligence gathering.8

Since that setback, the art of lawfare in outer space has settled on the objective ascribed to another teaching of Sun Tzu:

“With regard to precipitous heights, if you proceed your adversary, occupy the raised and sunny spots, and there wait for him to come up. Remember, if the enemy has occupied precipitous heights before you, do not follow him, but retreat and try to entice him away.”9

The second part of this teaching exemplifies the role of lawfare in the present war in outer space: to employ the tools and institutions of international law as a means to legally corner an adversary and gain geopolitical advantage in soft power, with the aim of slowing and eroding the advantage that adversary has attained through preeminence in the domain of outer space, and replace it with their own. This objective is accomplished by two general means: legally-binding measures, most commonly in the form of treaties, and so-called non-binding measures couched as sustainability.

Lawfare in space continued in the intervening years between Sputnik-1 and the signature and ratification of the Outer Space Treaty and afterward. The weapon of choice: disarmament proposals for outer space. Provisions for banning so-called space weapons in the Outer Space Treaty were rejected by the Soviet Union in favor of separate arms control measures.10 These measures included proposals, some of which related to the proscription of ASATs, designed to not only gain an advantage in outer space but to gauge political intent and resolve.11

The lawfare offensive escalated after the proposed Strategic Defense Initiative with an effort curtail space-based missile defense technology through a ban on so-called space weapons and a proverbial arms race in outer space. The Prevention of an Arms Race in Outer Space (PAROS), introduced in 1985, continues to seek a legally binding measure to place any weapon in outer space, including those designed for self-defense. It spawned measures such as the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (PPWT), co-sponsored by Russia and China. This and other measures have met resistance as unverifiable and certainly are not likely to gain the advice and consent of the US Senate for ratification. The end game of the use of lawfare in the form of efforts like PAROS—the latest attempt at which was defeated in Geneva—is to propose legally binding measures that proponents would ignore to their advantage in any event. The sponsors and advocates of these hard-law measures recognize they will not come to fruition but, in the process of promoting them, will enhance their soft power and moral authority, which can be applied to entice their adversary down.

Non-binding resolutions and measures in the form of political agreements and guidelines are being used concurrently in the lawfare engagement in outer space, where proposals for legally binding measures alone fall short of the goal of creating hard law and challenging dominance in outer space. These resolutions and measures, which emphasize sustainability, are designed to perform an end run around the formalities of a treaty to entice agreement on issues that would otherwise be unacceptable in a hard-law agreement. These measures have the dual effect to create soft-power support on the one hand and hard law on the other. This tool of lawfare, which uses clichés of cooperation and sustainability, is a ploy that applies the ambiguous nature of customary international law to achieve what cannot be done through treaties: to “entice the adversary away” and create legal and political constraints to bind and degrade its use of outer space or prevent it from maintaining its superiority, all the while allowing others to play catchup and replace one form of dominance with another. While lawfare is by nature asymmetric, this indirect approach could be considered a subset an irregular tactic of lawfare, as opposed to the use of formal treaties in lawfare.

The crux is that, like space objects used in outer space, international law and its implements are dual-use in that they can be used for proactive ends or weaponized, with those using the appliances of lawfare to encourage cession of the high ground choosing the latter rather than the former. The decision to weaponize international law and its institutions to prosecute this war in space brings into question the efficacy of new rules or norms. Indeed, the idea of expanding the jurisprudence of outer space through custom, as being suggested by the United States, and more recently gap-filling rules being suggested by academia that could become custom, presents the real chance that, rather than the creation of the ploughshare of sustainability, new and more effective swords for lawfare will be forged.

To paraphrase Sun Tzu, “all war is deception.” In the case of outer space, the pretext in the current war in space is that an arms race and a hot war in outer space is inevitable, and can only be avoided by formal rules or international governance. Conversely, a hot war can be prevented in no small part by using lawfare to engage in the contemporary war in space using the tools of, and the abundant resources found in, the experience of attorneys and litigators in particular to supplement and support diplomats to extend the velvet glove when applicable, and bare knuckles when necessary. If the August 14 statement in Geneva is any indicator, the United States may have just done that and begun the shift from light-touch diplomacy to bringing its legal warriors to bear in full-contact lawfare to engage and win the current war in outer space and help deter a more serious hot war from occurring without sacrificing the superiority it possesses in outer space.

#### The PPWT prohibits space-based missile defense

Jack M. Beard 16, Associate Professor of Law at the University of Nebraska College of Law, Feb 15 2016, "Soft Law ’s Failure on the Horizon: The International Code of Conduct for Outer Space Activities", University of Pennsylvania Journal of International Law, Vol. 38, No. 2, 2016, <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1086&context=spacelaw>

B. Avoid Arms Control Traps in Space

Any successful effort to achieve legally binding restrictions on military activities or weapons in space must focus on specific, definable, and limited objectives or run afoul of issues that have historically ensured deadlock among suspicious and insecure adversaries.306 Some seemingly desirable goals, however, are likely to ensure failure.

The first such problematic goal involves attempting to use arms control agreements or other instruments to comprehensively ensure peace in space. Unfortunately, the integration of modern military systems on earth, sea, air and space guarantees that at some point states seeking to disrupt or deny the ability of an adversary (such as the United States) to project power will find space capabilities to be a particularly appealing target, especially in the early stages of a crisis or conflict.307 The presence of so many things of military value in space thus makes actions by an adversary to neutralize, disrupt or destroy these things likely during a major conflict on earth.308

The second problematic arms control goal in space that seems certain to ensure stalemate involves attempting to define and prohibit military technologies with a view to broadly prevent the weaponization of space. Clearly defining a space weapon for purposes of any legally binding arms control agreement is a daunting task, one which is made particularly challenging by the “essentially military nature of space technology.”309 As noted, space technologies are routinely viewed as dual-use in nature, meaning that they can be readily employed for both civilian and military uses. Determining the ultimate purpose of many space technologies may thus depend on discerning the intentions of states, a process perhaps better suited for psychological than legal evaluation. 310

Further complicating the classification of space military technologies is the inherent difficulty in distinguishing most space weapons on the basis of their offensive and defensive roles or even their specific missions.311 For example, this problem lies at the heart of debates over the status and future of ballistic missile defense (BMD) programs, since the technology underlying BMD systems and offensive ASAT weapons is often indistinguishable.312 Vague and broad soft law instruments do not resolve this problem, but create instead their own confusion and insecurity. Vague and broad provisions in legally binding agreements that do not or cannot distinguish between these missions are similarly problematic.

These issues, particularly difficulties in distinguishing ASAT and BMD systems, have figured prominently in complicating negotiations on space weapons over previous decades.313 Similarly, these concerns were a significant factor in initial U.S. opposition to the arms control measure proposed by China and Russia (the PPWT) since it prohibits states from placing any type of weapon in outer space (regardless of its military mission), thus effectively prohibiting the deployment of ballistic missile defense systems. 314 Furthermore, even if clear legal restrictions could be developed, verifying compliance with respect to technology in orbit around Earth would be very difficult (a point conceded even by China with respect to its own proposed PPWT).315

#### Causes rogue state missile threats---that escalates

Patrick M. Shanahan 19, Acting Secretary of Defense from January to June 2019, previously vice president and general manager of Boeing Missile Defense Systems, Jan 2019, "2019 MISSILE DEFENSE REVIEW", US Department of Defense, https://media.defense.gov/2019/Jan/17/2002080666/-1/-1/1/2019-MISSILE-DEFENSE-REVIEW.PDF

U.S. Homeland Missile Defense will Stay Ahead of Rogue States’ Missile Threats

Technology trends point to the possibility of increasing rogue state missile threats to the U.S. homeland. Vulnerability to rogue state missile threats would endanger the American people and infrastructure, undermine the U.S. diplomatic position of strength, and could lead potential adversaries to mistakenly perceive the United States as susceptible to coercive escalation threats intended to preclude U.S. resolve to resist aggression abroad. Such misperceptions risk undermining our deterrence posture and messaging, and could lead adversaries to dangerous miscalculations regarding our commitment and resolve.

It is therefore imperative that U.S. missile defense capabilities provide effective protection against rogue state missile threats to the homeland now and into the future. The United States is technically capable of doing so and has adopted an active missile defense force-sizing measure for protection of the homeland. DoD will develop, acquire, and maintain the U.S. homeland missile defense capabilities necessary to effectively protect against possible missile attacks on the homeland posed by the long-range missile arsenals of rogue states, defined today as North Korea and Iran, and to support the other missile defense roles identified in this MDR.

This force-sizing measure for active U.S. missile defense is fully consistent with the 2018 NPR, and in order to keep pace with the threat, DoD will utilize existing defense systems and an increasing mix of advanced technologies, such as kinetic or directed-energy boost-phase defenses, and other advanced systems. It is technically challenging but feasible over time, affordable, and a strategic imperative. It will require the examination and possible fielding of advanced technologies to provide greater efficiencies for U.S. active missile defense capabilities, including space-based sensors and boost-phase defense capabilities. Further, because the related requirements will evolve as the long-range threat posed by rogue states evolves, it does not allow a static U.S. homeland defense architecture. Rather, it calls for a missile defense architecture that can adapt to emerging and unanticipated threats, including by adding capacity and the capability to surge missile defense as necessary in times of crisis or conflict.

In coming years, rogue state missile threats to the U.S. homeland will likely expand in numbers and complexity. There are and will remain inherent uncertainties regarding the potential pace and scope of that expansion. Consequently, the United States will not accept any limitation or constraint on the development or deployment of missile defense capabilities needed to protect the homeland against rogue missile threats. Accepting limits now could constrain or preclude missile defense technologies and options necessary in the future to effectively protect the American people.

As U.S. active defenses for the homeland continue to improve to stay ahead of rogue states’ missile threats, they could also provide a measure of protection against accidental or unauthorized missile launches. This defensive capability could be significant in the event of destabilizing domestic developments in any potential adversary armed with strategic weapons, and as long-range missile capabilities proliferate in coming years.

U.S. missile defense capabilities will be sized to provide continuing effective protection of the U.S. homeland against rogue states’ offensive missile threats. The United States relies on nuclear deterrence to address the large and more sophisticated Russian and Chinese intercontinental ballistic missile capabilities, as well as to deter attacks from any source consistent with long-standing U.S. declaratory policy as re-affirmed in the 2018 NPR.

# Case

### Case

#### Plan gets circumvented. It gets funneled through public private partnerships with space agencies.

**Davenport 20** (Christian Davenport covers NASA and the space industry for The Washington Post's Financial desk. He joined The Post in 2000 and has served as an editor on the Metro desk and as a reporter covering military affairs. He is the author of "The Space Barons: Elon Musk, Jeff Bezos and the Quest to Colonize the Cosmos". “A dollar can’t buy you a cup of coffee but that’s what NASA intends to pay for some moon rocks”. December 3, 2020.)

**NASA** **announced** Thursday **that several companies** had **won contracts to mine the moon** and turn over small samples to the space agency for a small fee. In one case, a company called Lunar Outpost bid $1 for the work, a price NASA jumped at after deciding the Colorado-based robotics firm had the technical ability to deliver. “You’d be surprised at what a dollar can buy you in space,” Mike Gold, NASA’s acting associate administrator for international and interagency relations, said in a call with reporters. But the modest financial incentives are not the driver of the program. Nor to a large extent is the actual lunar soil. NASA is asking for only small amounts — between 50 and 500 grams (or 1.8 ounces to about 18 ounces). While there would be scientific benefits to the mission, **it’s** really **a tech**nology **development program, allowing companies to practice extracting resources from the lunar surface** and then selling them. It would also establish a legal precedent that would pave the way for companies to mine celestial bodies in an effort blessed by the U.S. government to help build a sustainable presence on the moon and elsewhere. To do that, **NASA** says it **needs its astronauts**, like the western pioneers, to “live off the land,” **using the resources in space instead of hauling them from Earth**. The moon, for example, has plenty of water in the form of ice. **That’s not only key to sustaining human life, but** the hydrogen and oxygen in water **could also be used as rocket fuel, making the moon a potential gas station in space** that could help explorers reach farther into the solar system. **Asteroids also have significant resources, particularly precious metals that could be used for in-space manufacturing.** While the prospect of large mining and manufacturing facilities in orbit is still many years away, NASA wants to use the mining program as a small step toward that goal. NASA is now trying to return astronauts to the moon under its Artemis program for the first time since 1972. Unlike its predecessor, Apollo, where the astronauts visited the lunar surface for a short while before coming home, the Artemis program would create a permanent presence on and around the moon. “**The ability to extract and utilize space resources is the key to achieving this objective of sustainability**,” Gold said. “We must learn to generate our own water, air and even fuel. Living off the land will enable ambitious exploration activities that will result in awe-inspiring science and unprecedented discoveries.” In 2015, then-President Barack Obama signed a law that allowed private companies the right to own the resources they mined in space. Under the program announced Thursday, NASA said the materials would be transferred from the private companies to NASA. **The effort would not violate the 1967 Outer Space Treaty**, NASA officials have said, which prohibits nations from claiming sovereignty over a celestial body. NASA Administrator Jim Bridenstine previously likened the policy to the rules governing the seas. “We do believe **we can extract and utilize the resources of the moon, just as we can extract and utilize tuna from the ocean**,” he said earlier this year. As part of its lunar exploration mission, NASA has been working to get countries around the world to adopt what it calls the Artemis Accords, a legal framework that would govern behavior in space and on celestial bodies such as the moon. The rules would allow private companies to extract lunar resources and create safety zones to prevent conflict and ensure that countries act transparently about their plans in space, while sharing their scientific discoveries. The mining announcement came during the same week that China landed a spacecraft on the moon, extracted resources and then lifted off from the lunar surface in an effort to return the sample to Earth. Instead of developing and sustaining a big government sample-return mission, **NASA is taking another approach by partnering with the private sector**. “If you step back and think about how really amazing it is that NASA can essentially piggyback on the private-sector space capabilities to perform this mission, it would not have been possible 10 years ago,” said Phil McAlister, the director of NASA’s commercial spaceflight division. **In addition to Lunar Outpost, the other companies chosen for NASA’s** program **are**: **ispace Japan and Europe**, which would each charge $5,000 for the material; **and Masten Space Systems of California**, would charge $15,000. All of the companies would already be on the moon, according to NASA, conducting other missions. McAlister said Lunar Outpost would be ferried to the moon by the lunar lander known as Blue Moon being developed by Jeff Bezos’s Blue Origin. (Bezos owns The Washington Post.) The company later clarified that it was looking at a number of landers to get it to the lunar surface, and not just Blue Origin’s. The ispace companies would fly on a Japanese lander, McAlister said, and Masten, already part of another NASA lunar contract, would use its own Masten XL-1 lander.

### Advantage 1

#### Substitutes solve REMs

Adam Currie, market writer, 3/18/13 [“Rare Earth Recycling: Risk to Sector or Investment Opportunity?” Rare Earth Investing News, 2013, http://rareearthinvestingnews.com/9255-rare-earth-recycling-risk-to-sector-or-investment-opportunity.html]

While Honda has impressed investors by succeeding in its recycling goals and its plans to commercialize this recycling process, it is not the only company focused on innovation. Since the industry underwent a severe shake up in 2008, more and more manufacturers have begun seeking alternative solutions aimed at either decreasing their dependence on rare earths, or securing their own REE supply.¶ In 2012, Toyota (TSE:7203) announced that it had developed a method to manufacture hybrid and electric vehicles (EVs) without the use of rare earth metals, while General Motors Company (NYSE:GM) confirmed it was “close to a breakthrough” that would reduce its need for dysprosium, a rare earth in especially high demand. Japan’s Hitachi (TSE:6501) has been clear of its intentions to move away from the use of REEs, announcing in April last year a highly-efficient permanent magnet synchronous motor that employs an iron-based amorphous metal in the core – and, crucially, no REEs.¶ Also, Ford (NYSE:F) announced that its nickel-metal-hydride batteries will be replaced with lithium-ion alternatives in a move that could see the company cut 500,000 pounds of REEs from its manufacturing process annually, while the US Department of Energy’s (DOE) Ames Laboratory confirmed that it too is working towards creating a method to remove neodymium from the mix of other materials in magnets.

#### No colonization.

**Creighton 18** (Jolene Creighton was the Founding Editor-in-Chief of the science news site Futurism. Creighton began her career as an instructor at the [University of Southern Mississippi](https://en.wikipedia.org/wiki/University_of_Southern_Mississippi), where she taught courses on English and writing. In 2012, she co-founded the science news site *From Quarks* to *Quasars*, which was acquired in 2015.[[](https://en.wikipedia.org/wiki/Jolene_Creighton#cite_note-10)  Creighton left academia and fully transitioned to journalism later in 2015, when she helped launch *Futurism*. “Neil deGrasse Tyson Says Humans Will Never Colonize Mars”. 2/20/18.)

**SpaceX**. **Mars One. NASA. These** three **organizations have bold plans to** be the first to **colonize Mars** in the next few decades. **To astrophysicist Neil deGrasse Tyson, those plans are**n’t just bold. They’re foolhardy and ill-advised. They may even be **impossible**. When I met with Tyson last month at the World Government Summit in Dubai, he made it clear that the plan to create a civilization on Mars is entirely absurd. **His reasoning is simple: Mars is entirely inhospitable to life as we know it.** First of all, that means **no one will *want* to live there**. **Humans** generally **like to live in places that aren’t** quite so, well, **deadly**. “We’d rather stay where it is warm and comfortable,” he said. This simple reasoning explains why we don’t find populated cities dotting the landscapes at Earth’s poles. Antarctica is both warmer and wetter than any place on Mars, and we don’t exactly see people lined up to live in the Arctic tundra. We won’t see cities flourishing on Mars for the same reason, Tyson says. Like the icy recesses of our own planet, Tyson says that some humans will venture to Mars for short visits, but they won’t remain for long. “Definitely, we’ll visit as a vacation spot. [But] I’m skeptical that you’ll find legions of people that will go there and want to stay,” he said. But **it’s not just that humans would find Mars** an **unappealing** home. **According to Tyson, humans *can’t* colonize Mars. The Red Planet has a notoriously thin atmosphere and no global magnetic field.** As a result, deadly **cosmic rays and UV radiation** shower the Martian surface, **transform**ing **the soil into a “toxic cocktail” of chemicals and caus**ing **temperatures to plunge to minus 62 degrees Celsius** (minus 80 degrees Fahrenheit). **To survive under these deadly conditions, humans would require “an entire infrastructure in which you live that mimics Earth,” Tyson says—and that’s pretty much impossible to create on a global scale.** Instead of setting our sights on generations of humans living on Mars, Tyson says we should hope for “just an Earth outpost” at best. So, will anyone actually colonize Mars? Tyson isn’t optimistic. “My read of history tells me, no. Not because I don’t want it to be so. I’m just a realist about this.” In a speech later that day, Tyson called for “a rational assessment” of our ability to settle space and railed against those who make predictions based on “deeply delusional premises.” To those at the helms of SpaceX, Mars One, and NASA, going to Mars probably doesn’t seem delusional. It just requires more preparation. But if **colonizing Mars isn’t possible because of humans’ *biology***, well, maybe they will have to reassess after all.\

#### No cyberwar impact---empirics, no escalation, attribution, and costs

Borghard 19—Assistant Professor in the Army Cyber Institute at the United States Military Academy at West Point [Erica D. Borghard and Shawn W. Lonergan (Assistant Professor of International Relations in the Department of Social Science at USMA), Fall 2019, “Cyber Operations as Imperfect Tools of Escalation”, Strategic Studies Quarterly, <https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-13_Issue-3/Borghard.pdf>] AMarb

However, there are important empirical reasons to suspect that the risks of cyber escalation may be exaggerated. Specifically, if cyberspace is in fact an environment that (perhaps even more so than others) generates severe escalation risks, why has cyber escalation not yet occurred? Most interactions between cyber rivals have been characterized by limited volleys that have not escalated beyond nuisance levels and have been largely contained below the use-of-force threshold.5 For example, in a survey of cyber incidents and responses between 2000 and 2014, Brandon Valeriano et al. find that “rivals tend to respond only to lower-level [cyber] incidents and the response tends to check the intrusion as opposed to seek escalation dominance. The majority of cyber escalation episodes are at a low severity threshold and are non-escalatory. These incidents are usually ‘tit-for-tat’ type responses within one step of the original incident.”6 Even in the two rare examples in which states employed kinetic force in response to adversary cyber operations—the US counter-ISIL drone campaign in 2015 and Israel’s airstrike against Hamas cyber operatives in 2019—the use of force was circumscribed and did not escalate the overall conflict (not to mention that force was used against nonstate adversaries with limited potential to meaningfully escalate in response to US or Israeli force).7 We posit that cyber escalation has not occurred because cyber operations are poor tools of escalation. In particular, we argue that this stems from key characteristics of offensive cyber capabilities that limit escalation through four mechanisms. First, retaliatory offensive cyber operations may not exist at the desired time of employment. Second, even under conditions where they may exist, their effects are uncertain and often relatively limited. Third, several attributes of offensive cyber operations generate important tradeoffs for decision-makers that may make them hesitant to employ capabilities in some circumstances. Finally, the alternative of cross-domain escalation—responding to a cyber incident with noncyber, kinetic instruments—is unlikely to be chosen except under rare circumstances, given the limited cost-generation potential of offensive cyber operations. In this article, we define cyber escalation and then explore the implications of the technical features and requirements for offensive cyber operations. We also consider potential alternative or critical responses to each of these logics. Finally, we evaluate the implications for US policy making.

#### Cyber attacks won’t take down the grid

Victoria Craig 16, Analyst at Fox Business, Citing the Senior Manager of Industrial Control Systems at Mandiant, “The U.S. Power Grid is 'Vulnerable,' But Don't Panic Just Yet”, http://www.foxbusiness.com/features/2016/02/02/u-s-power-grid-is-vulnerable-but-dont-panic-just-yet.html

The idea of the nation's power grids becoming the next battleground for cyber warriors could make hacking into consumers’ credit card accounts and personal information seem like child’s play. While U.S. power companies are likely targeted by foreign governments and others in increasingly sophisticated breaches, actually shutting off the lights and causing chaos is far more complicated than many pundits make it seem. Dan Scali, senior manager of industrial control systems at Mandiant, a cybersecurity consulting arm of FireEye ([FEYE](http://www.foxbusiness.com/quote.html?stockTicker=FEYE)), explained that while cyber criminals may gain access to power and utility data systems, it doesn’t necessarily mean the result will be a power outage and a total takedown of power grid control systems. In other words, the power grid is controlled by more than just a panel of digital buttons. “Losing the control system is bad from the perspective that it takes you out of your normal mode of operations of being able to control everything from one command center, but it doesn’t mean you’ve lost control or all the lights go out [in the city],” Scali explained. While many of the systems have been modernized to include digitized control panels, if a hacker were to infiltrate the system, a utility worker could still have the ability to manually control the machines by flipping a switch, pushing a button, or tripping a breaker. As the world saw with the recent attack in Ukraine, which caused a blackout for 80,000 customers of the nation’s western utility, the biggest problem may be ensuring the power grid’s control systems are not vulnerable to cyber break ins. The January attack in Ukraine was likely caused by a corrupted Microsoft Word attachment that allowed remote control over the computer, according to the U.S. Department of Homeland Security. Scali said there was no evidence from the incident in Ukraine that the hacker’s malware was able to physically shut down the power. “It wiped out machines, deleted all the files. Kill disk malware made it impossible to remotely control things. It caused chaos on the business network, and the area where control system operations sat. But the attacker, we believe, would have had to actually used the control system to cause load shedding, which caused the power to go out, or trip breakers to cause the actual problem. Malware itself didn’t turn the power out,” Scali said. He said what most likely happened in that incident was the hacker stole user credentials and logged into the system remotely. The bottom line: Yes, a similar event could happen in the U.S. And corporate America is concerned. A recent survey released in January on the state of information security, conducted by consulting firm Pricewaterhouse Coopers, showed cybersecurity as one of the biggest concerns among the top brass at U.S. power and utilities firms. Part of the problem, Brad Bauch, security and cyber sector leader at PwC said, is the interconnectedness of the industry’s tools. “Utilities want to be able to get information out of [their] systems to more efficiently operate them, and also share that information with customers so they have more real-time information into their usage,” he explained. While allowing access to their own consumption data allows the companies to give their customers more of what they want, it also opens up a host of access points for hackers, making the systems more vulnerable than they otherwise would be. But to say that the power grid is susceptible to cyber hackers is a bit of an oversimplification

#### The smart city is lock in austerity, militarism, and financialization of the economy.

Morozov 18 (Evgeny Morozov, former visiting scholar at Stanford University and a Schwartz fellow at the New America Foundation, fellow at Georgetown University, fellow at the Open Society Foundations, Director of New Media at Transitions Online; Francesca Bria, Chief Technology and Digital Innovation Officer for the City of Barcelona, MSc in E-business and Innovation from the University College of London; “Rethinking the Smart City: Democratizing Urban Technology,” January 2018, http://www.rosalux-nyc.org/wp-content/files\_mf/morozovandbria\_eng\_final55.pdf)

1. The Smart City: A Counter-History

The weakness of the corporate case for the smart city becomes increasingly clear once one notices that its history is usually allocated only several brief sentences in the already thin advertising brochures pitching various corporate services (such brochures have become the primary and almost exclusive literary medium of this industry). Contemporary histories of smart cities are, as one academic article colourfully put it,9 perfect examples of corporate storytelling: Stripped of all politics and accounts of contestation, these narratives inevitably celebrate the unstoppable march of progress and innovation, greatly accelerated by the ingenuity and inventiveness of the private sector.

Thus, smart cities are invariably presented as logical high-points in cities’ technology- and information-driven evolution, their growth and ubiquity checked only by the rate of civilization’s inventiveness rather than external political or economic factors. Previous instantiations of this same idea—the media city, the information city, the telematic city, the city of bits—almost never receive a mention. In the rare cases when they do, it is mostly to signal the inability of those earlier concepts to live up—in technological terms—to the utopian visions invested in them. Rarely is context provided for the sudden explosion of “smart” as the moniker du jour, as if the notion simply dropped from the sky and immediately found like-minded allies in city after city.

Academics who have looked into the term’s genealogy point out that its origins (as well as its phenomenal global reception) are to be found in the reorientation of major fi rms like IBM away from their traditional business model of hardware and software sales to selling services, including consulting.10 As IBM embarked upon its “smarter planet” strategy, seeking to orient itself towards various optimization needs in both the private and public sectors (eventually culminating in the production of yet another buzzword—“cognitive computing”—of which IBM Watson is allegedly king), it was fortunate enough to stumble upon the term “smart” in relation to cities, putting the term into wider circulation among the business community11 (IBM initially trademarked the term “smarter cities,” but eventually settled on “smart cities” instead).

The many predecessors which emphasized the ecological over the technological dimension of smartness—the green city, the eco-friendly city, the sustainable city, the zero-carbon city —are also rarely evoked, even if the need to cut emissions and energy costs was one of the primary drivers pushing cities to experiment with smart technologies and continues to be the factor helping to humanize the corporate smart city agenda. In the absence of other immediately available and affordable ways to fight climate change, cities will continue to reach for corporate digital solutions—while opposing this process in any meaningful way would also mean to risk drawing the ire of environmentalists.

From the perspective of cities, the motivations behind opting for smart city solutions can be roughly classified into two types: normative and pragmatic. The former refers to long-running efforts to deploy technology to achieve ambitious and universally accepted political goals like promoting political participation among ordinary citizens, helping to personalize public services and de-bureaucratize national and local governments, creating a more enjoyable and less discriminatory urban environment to stimulate economic growth, reduce tension, and promote creativity and serendipitous discovery.

The second type of motivation, that of the pragmatic variety, spans a much broader and more heterogeneous set of objectives. Some cities want smart technologies because they promise immense savings on the provision of slightly similar or even better type of services during a period of budget cuts and harsh austerity. Others desire them because they want more security and policing, particularly on the eve or during so-called mega events like the Olympics, which have come to provide an economic lifeline to many cities compelled to replace their manufacturing base with tourism. Smart CCTV cameras, along with sensors present in much of the built environment and new techniques of predictive policing, allow cities to exercise targeted, eff ective controls over areas previously hard to reach and govern.

Combined with ever-improving drones and a new generation of policing robots, smart technologies foster a context of heavily militarized urbanism previously restricted to hotspots like Fallujah.12

Finally, some cities opt for smart technologies because they promise to pragmatically resolve a problem which may be specifi c to that particular city: congestion caused by crumbling road infrastructure and lack of repairs, a lack of jobs which (with some luck) can disappear as smart money follows smart citizens into the smart and creative urban districts, or an ineff ective garbage disposal system that clogs the streets and frustrates citizens who feel that garbage trucks have excessive capacity when little garbage is around and always seem to be overstretched when needed the most. Just imagine: Real-time, immediate feedback loops with the capacity to learn, listen, and adjust thanks to clever sensors inserted into “smart trashcans” which can tell passing trucks they need to be emptied—has there ever been a cleverer solution to the problem of garbage disposal?

2. Smartness and Neoliberalism

The dynamics and concurrent imperatives of the three aforementioned rationales can be grasped without recourse to any advanced analytical or historical frameworks. Once we factor in the additional consideration that most cities embarking on smart city experiments also happen to be caught up in the regulatory apparatuses of neoliberalism, however, several additional considerations come to the fore. First of all, if neoliberalism—as many scholars have argued over the years—is characterized by the transition from a form of rule enacted by a centralized government to one underpinned by decentralized governance, then we must also account for the precise mechanisms (and technological enablers) of this newer, softer, less obvious form of rule. One such mechanism identified in the burgeoning literature on neoliberalism in general13 as well as in the some-what smaller literature on neoliberalism and cities14 is the growing importance of rankings, competitive tables, and comparative scores. City indebtedness rankings by credit agencies like Moody’s or Standard & Poor’s represent the root of this trend, with cities vying for a favourable rating which determines their costs of borrowing. Today, this function is further exercised by various rankings—measuring innovation, creativity, or even smartness itself—compiled by the emerging urban-philanthrocapitalist complex of think-tanks, foundations, and allegedly neutral NGOs, determining the broader constraints and parameters within which cities now compete.

\*\*\* Box 3 \*\*\*

Box 3. Smart Cities Beyond the Global North

Unlike Western Europe, North America and parts of South America, where the smart city revolves primarily around infrastructural improvements to existing cities, in Asia, India, and, to a lesser extent, China, we fi nd numerous examples of “smart cities” being built from scratch. Thus, whereas the dominant smart city discourse in the Global North is often synonymous with that of privatization of (existing) municipal services, in the Global South the discussion is often driven by imperatives of state-led urbanization and the formalization of previously informal industries and services, often overlapping with discourses of fi nancial inclusion and entrepreneurship (as in India) or ecology and sustainability (as in China). In both cases, the term “smart” seems to emerge as the least problematic moniker for a set of rather conventional neoliberal policies and prescriptions which can now be reactivated against considerably less political resistance.

India’s Smart Cities Mission is one of the most ambitious government-led programs to develop more than 100 smart cities across the country. This has predictably generated a great deal of interest among consultants and garnered attention from foreign players, many of them viewing the smart city business as yet another opportunity to regroup and retool their fl agging services for the digital age. Thus, fi rms from China, Russia, Japan, the US, Germany, and France have all signed up to participate in the building of India’s smart cities. Predictably, the program has triggered a backlash, with many activists and academics pointing out that it fi ts all too well with Narendra Modi’s overall plans to make India more attractive for foreign capital, even if this entails greater inequality, deregulation (particularly in the interests of designating some of those cities as special economic zones), discrimination, and misappropriation of public funds to cater to the needs and interests of the well-off elites most likely to populate India’s “smart cities” (which, needless to say, are also imagined as “global” cities). India is a country where billionaires and corporations already build their own, completely privatized cities (e.g., Lavasa or Gurgaon), ensuring that the shock value of 100+ smart cities arising over just several years is not as great as one might expect.

\*\*\* end box 3 \*\*\*

How cities perform on those secondary indicators in turn feeds into how investors view their competitiveness, which ultimately flows into the ratings assigned by credit agencies, thus affecting their borrowing costs. Most cities have little choice but to borrow as a result of their budgets being cut by national governments; the worsening economic conditions in many of them—most visible in the looming public sector pension crises—produce additional financial strain. Consequently, a city need not harbor any strong, rational desire to be smart in order to embark on a smart city agenda of some kind—doing otherwise would mean risking one’s standing on the international bond markets.

Related to this is the pressure facing many cities to quantify the performance of their various constituent parts in order to render them more accountable, competitive, and manageable—another phenomenon commonly associated with the ascendance of neoliberalism and its “audit society” or “logic of discipline,”15 depending on one’s theoretical predilections. While this drive to quantification—led by cities like Boston, which has its own “city score”—is rarely linked to the smart city phenomenon (at least not in popular discourse), it is nevertheless rather obvious that the ranking-of-everything mentality upon which it rests is only possible in a city capable of collecting, analysing, and processing vast amounts of data. Thus, willingly or not, the smart city agenda along with the infrastructure of sensors and connectivity it promotes also opens the door to the kind of audit-obsessed quantifi cation celebrated by neoliberalism.

An analytical lens well-trained on the methods, techniques, and aspirations of neoliberalism can help us to reveal several other dimensions of the smart city problematique which usually escape those analyzing it from a purely technical perspective. In the last three decades, as the logic of corporatism and embedded liberalism dominating the political landscape of Western Europe and North America gave way to the logic of highly globalized and liquid capital elevating the interests of finance over those of any other sector of society (including the productive economy), cities, like all other units of society, have found themselves subjected to immense pressure to both roll back some institutions of the welfare state, as well as roll out some policy innovations of their own.16

Two such processes are of particular importance to our discussion: the delegation and subcontracting of responsibilities previously re-served to public institutions to private players, along with the enlistment of private financial capital—mostly from pension funds, insurance fi rms, various alternative asset management funds—into the management, maintenance, and construction of infrastructure, most of which operates at a local level. Both exhibit significant, albeit underexplored connections to the smart city agenda, as both require an extensive infrastructure of gathering, analyzing, and acting upon data to succeed and proliferate.

Subcontracting can, of course, be described as a further privatization of public services— indeed, such a description would be entirely correct. While the exact service providers and distribution of responsibility between them and public institutions vary from country to country, we can nonetheless identify several similarities. First, much of this subcontracting is facilitated by the so-called Big Four accounting and consulting fi rms (Ernst & Young, Deloitte, PwC, KPMG), many of which now double as technology providers, investing heavily in technologies like blockchain and Big Data.

Some speak of the “solutions economy” (Deloitte), while others promise an “outcome economy” (Accenture). The end result, however, is the same: This model rests on the commodifiation of solutions to social and political problems, the enlistment of actors (like banks and other financial institutions) which would traditionally not be part of the “solution,” and the intensive deployment of data analytics and measurement to assess whether specific targets or outcomes are being delivered, coupled with timely interventions to steer the process towards said outcomes. None of this would be possible without an extensive infrastructure for tracking and controlling both physical and human resources, with quantification of performance paving the way for all sorts of other, even more advanced experiments to be constructed on this foundation.

The rapid proliferation of social impact bonds illustrates the operative logic of the hybrid “solutions” or “outcome” economy at play here. Such bonds are issued by governments as they delegate responsibility for a particular sector— such as prisons or schools—to financial fi rms like Goldman Sachs. The latter pledges to meet a particular target such as of repeated offenses in the case of prisons or literacy rates in the case of schools, and is only paid for its services if that target is met. To encourage financial firms to participate in such endeavours, their risks are often underwritten by foundations, who, caught up in their own philanthrocapitalist bliss, would like to see the social sector become subservient to the logic of financialization.

The practice is extremely controversial and several such experiments have already failed, but that should not detract us from grasping one important feature of what a successful social investment bond entails from the perspective of, say, Goldman Sachs: It requires the ability to monitor and extract the maximum amount of value from resources under management, which entails perpetual surveillance coupled with nudging and other forms of producing desired behavior. Moreover, should monitoring capacity prove insufficient, it would be advantageous to have the means to produce statistics so obscure and impenetrable that the operating entity—in this case, Goldman Sachs— can claim that it has in fact met its target and should be paid the amount due (as regularly happens in actual projects financed through social investment bonds). Surrendering control over such statistical and computation capabilities—an inevitable consequence of the privatized smart city—is a sure way to be swindled by private service providers on a regular basis.

The enlistment of fi nancial capital into the provision of infrastructure operates according to a rather similar logic. Most industry players from asset management funds to private equity fi rms do not intend to hold the infrastructure they invest in for a long period of time; usually, they hope to make a large enough speculative gain and exit within a decade (although even if the speculative gain is not large enough, most such fi rms earn their money from transaction and management fees independent of returns).

The model’s obvious downside is chronic underinvestment into long-term facilities and planning of the infrastructure in question, as investors adopting a short-term perspective are not motivated to undertake expensive infrastructural upgrades. This is only part of the problem, however, as investors also seek to extract as much value from the asset under management in the short period of time they own it as possible, often degrading it much faster than a longer-term operator or owner would. This is known as “sweating the asset” in industry parlance—a typical practice among infrastructure investors.

\*\*\* Box 5 \*\*\*

Box 5. Infrastructure’s Emergence as an Alternative Asset Class

The stagnant global economy and low interest rates it spawned are responsible for a growing interest among many investorsy—from pension funds to boutique asset management fi rms—in infrastructure. As one of several alternative assets, it still occupies a minor role compared to investments in private equity, hedge funds, or venture capital. Nonetheless, certain features of this particular asset class make infrastructure—from toll-operated roads to airports to sewers—highly appealing to investors, as it offers a stable, long-term return and is well-protected from inflation and economic fluctuations. Infrastructural investments are generally of two types: “greenfield” (where the infrastructures in question are built from scratch, yielding higher risks but also higher payoff s) and “brownfield” (investments in already existing infrastructures, sparing investors the higher risks associated with construction but also lowering expected returns). Both types usually involve governments and municipalities, as much infrastructure is financed through public-private partnerships whereby the local authorities often grant private operators concessions to operate certain infrastructures in exchange for a significant upfront payment calculated against expected returns. Such models typically incentivize the operator to cut costs (e.g., by eliminating maintenance) and extract maximum rents (e.g., by charging users different rates depending on how much of the resource they consume or, say, their ability to pay). The ubiquity of “smart” and always-on sensory infrastructures allows investors to pursue both of these strategies at once: costs can be minimized and completely pushed onto users, while the ability to recognize the user and link any act of consumption with their entire life history facilitates a price that the user is unlikely to turn down. Thus, the proliferation of sensors, connectivity, and data analytics into the built environment is likely to entrench today’s highly financialized model of infrastructure provision. The same is true of real estate to some extent, where the ability to retrofit buildings with sensors and engage in sophisticated forms of asset management allegedly adds value to the property in question.

\*\*\* End Box 5 \*\*\*

This occurs in several ways. One method is to charge users the highest bearable price, usually a rather high figure with infrastructure as most of these goods and assets are almost by definition scarce and do not have easy alternatives. Another method is to use the assets more heavily, ensuring they never lie dormant and increasing capacity utilization almost to the maximum. This may have been a difficult undertaking twenty or thirty years ago, but with today’s sensors and ubiquitous capability, finding alternative users for dormant infrastructure is as easy as finding tenants for an empty apartment on Airbnb.

In other words, “sweating the asset” presupposes the same smart infrastructure of sensors, connectivity, and basic computing as the outcome and solutions economy: Neoliberal techniques appear far less effective in the absence of technological infrastructure to activate and profit from them. The need to charge people different prices based on their ability and eagerness to pay also points to the importance of personal and reputational data in this model’s proliferation: As long as differentiated pricing remains the best way to maximize one’s revenue stream from an asset, we can rest assured that sensors—including highly advanced biometric sensors capable of identifying us and linking our faces to our social media accounts—will continue to invade our cities.

To even try to explain the proliferation of assets and connectivity in the built environment without looking at the underlying political and economic drivers is thus a rather futile exercise. One can, of course, go on hoping that these sensors and routers will be deployed to humanize and personalize national and local bureaucracy—yet this seems like a rather naïve aspiration given that bureaucracy itself is increasingly being taken out of the government’s hands. Once privatized, this humanizing rationale disappears as if it never existed: A privatized toll road—the quintessential example of smart infrastructure built to “sweat the asset”—has no need for humanism.

Surprisingly, most traditional accounts of the rise of smart city ideology downplay the role of the most powerful sector in our cities, real estate and construction companies—if they mention it at all. In a way, their interest in “smartness” is similar to that of infrastructure investors: Sensors and connectivity allow for more hands-on management of their resources, including buildings, the structural faults, problems, and inefficiencies of which can now be identified, fixed, and predicted in real time. This transition to “smart buildings” and “smart assets” allows real estate fi rms to charge a “smartness” premium, thus driving up the already prohibitive costs of real estate.17

Once such buildings and assets proliferate, cities can market entire “smart districts”, accelerating the process of gentrification and driving rents even higher—especially if one can also demonstrate that the area is popular among local entrepreneurs and start-ups. Tellingly, Richard Florida, the proselytizer-in-chief of the “creative class” and the requisite “start-up cities,” has now become the main cheerleader for “start-up districts,”18 drawing up (as one would expect) rankings of districts based on their “smartness” and “startuppiness.”

Moreover, the proliferation of secondary data on tenants permits a more effective form of renter screening, reducing the risks of delayed payment and other costs associated with problematic tenants. Not surprisingly, several start-ups already offer such screening services, promising landlords and real estate fi rms risk profiles of potential tenants based on careful analysis of their online activity. In this instance, the logic of the gated community is applied not only to the outside but increasingly within: Credit scores and letters of reference no longer suffice, one must now work and produce the requisite online reputation to qualify to live in a particular “building.” This production of the complacent entrepreneurial ethos is very much in line with the overall project of reengineering the soul as advanced by neoliberalism.

#### Their resource wars ev is speculative and just asserts that because people in superpowers can be hungry nuke war is an option. No scenario.

#### Turn- Resource scarcities cause peace

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2.2.Natural resources as potential peace vectors

Although comprehensive research on the issue remains limited, an evolving trend is observed in the literature since the beginning of the 21st century, focusing on the biophysical environment as a potential conflict transformation and resolution tool, rather than a conflict irritant (Pachauri et al., 2009, Fröhlich, 2010). Challenging the existing theories of “environmental wars”, the research not only highlights the fact that conflict and cooperation can coexist, but also insists on the transformative potential of environmental cooperation (Giordano et al., 2005). Indeed, the complex, uncertain, and long-term nature of environmental issues seems to create “functional interdependencies” between trans-border communities that can, as above-mentioned, bring them to conflict, but also to dialogue and eventually cooperation (Conca and Dabelko, 2002). The “environmental peacemaking” framework was initially adopteded by Conca and Dabelko (2002). This approach is the most prevalent in the scientific literature, although the paradigm has somewhat mutated since then, and is also commonly referred to as environmental peacebuilding, peace ecology, or environmental peace. Conca and Dabelko (2002) identify two main pathways for environmental peacemaking. First, the biophysical environment can be used to improve intergovernmental relations and create linkages between communities across political borders. Second, it can create interdependence between these transboundary communities and potentially contribute to forging a regional identity. Beyond stabilising interstate relations, environmental cooperation can thus contribute to fostering trans-societal relations and lay the ground for a “shared collective identity” (Conca, 2002) or a “shared social identity” (Zikos et al., 2015) between former or potential conflict parties.

Following this initial research, the environmental peacemaking framework has gradually evolved from a conflict resolution tool to a more comprehensive, transformative peacebuilding approach. Environmental peacemaking activities are commonly classified into three categories (Maas et al., 2013, Conca et al., 2005, Carius, 2007).

The first and most direct type of environmental peacemaking consists of activities that are aimed at preventing environmental conflicts. As pointed out by the scarcity school, when natural resources are not sufficient for all groups exploiting them, tensions and violent conflicts might erupt. Therefore, limiting human pressure on these resources, coupled with strengthening of the institutions in charge of their management, is one way to alleviate these pressures and the associated conflict risks (Carius, 2007, Conca et al., 2005). This is especially true in situations of power asymmetry between groups, where access to natural resources and their economic benefits is determined by ethnic, economic or other socio-cultural differentiations (Zeitoun, 2008, Conca et al., 2005, Carius, 2007).

The second approach aims at building “peace through cooperative responses to shared environmental challenges” (Conca et al., 2005). This approach tries to bring conflict parties together to stimulate dialogue through environmental cooperation, in order to foster trust between former conflict parties, paving the way for conflict de-escalation, political cooperation, social transformation, and eventually reconciliation (Carius, 2007). Through regular interaction and dialogue, competing parties gradually evolve from a narrative of resource scarcity that is characterised by uncertainty and security concerns (Ide and Scheffran, 2008), in order to identify sustainable, win-win solutions to shared environmental problems – such as transboundary pollution. These dialogues and collaborations can, in turn, contribute to restoring trust between former conflict parties, and lay the foundations for durable reconciliation (Carius, 2007, Wolf, 2007, Matthew et al., 2009, Jensen and Lonergan, 2013). As an example, Ali (2007) cites the case of Darfur, where an ethnic-political conflict could be deescalated through the common challenge of desertification. The benefits of environmental cooperation are of a special nature, making it seem that environmental peacebuilding has the potential to bring together conflict parties even while violence is ongoing. Water negotiations between Israel and Jordan illustrate this (Wolf et al., 2005, Jägerskog, 2013). Another example of environmental cooperation as a tool for dialogue is the 1960 Indus Waters Treaty and subsequent creation of an Indus Commission, which survived several wars between India and Pakistan (Wolf et al., 2005, Swain, 2002).

Finally, dialogue on environmental issues can lay the foundations for future cooperation in other domains. It does so by creating a climate of cooperation and political cooperation and negotiations, which can result in institutionalised forms of interactions between conflicting parties (Conca and Dabelko, 2002, Carius, 2007). Environmental cooperation can thus create opportunities for interstate bargaining and can lead the way to political and institutional forms of cooperation and, in turn, “lasting peace by promoting conditions for sustainable development” (Conca et al., 2005, Carius, 2007). Ultimately, by treating the root-causes of conflicts, environmental peacebuilding has the potential to deter future conflicts between competing parties, rendering the use of violence as unimaginable (Conca and Dabelko, 2002).

In sum, environmental issues present multiple opportunities to promote dialogue and cooperation between former, current, or possible future conflict parties. The critical nature of environmental problems for human survival is key to this potential and renders environmental cooperation an important potential component of peacebuilding (FoEME, 2008). Natural resources that are shared by conflicting parties are, thus, a good entry point for dialogue and negotiation, which can later extend beyond environmental issues, laying the roots for peace and reconciliation. This process is captured in Figure 2.

Despite this, there is no unified model or definition of the concept, and little empirical research on the topic has been carried out. There is, for example, a lack of studies which assess the effect of environmental cooperation, and the quantitative data which are available sometimes show contradictory findings on environmental issues and their correlation with either conflict or peace (Ide and Scheffran, 2008).

3. Discussion

Environmental cooperation is identified by an increasing number of researchers as a potential tool for peacebuilding. However, as aforementioned, there is a lack of empirical evidence to corroborate the existence of a direct relationship between the biophysical environment and either conflict or peace. Indeed, environmental peacebuilding is not a “coherent theoretical school”, nor a “distinct set of practical activities”, but is instead “an umbrella term that covers a wide range of aspects on the relationships between environment, conflict, and peace” (Maas et al., 2013). The difficulty to test this link between environmental issues and peacebuilding is partly due to the absence of adequate indicators to measure environmental cooperation (Conca and Dabelko, 2002). Another difficulty is the fact that several elements of this emerging framework are still unclear. The upcoming discussion focuses on three particular aspects of the environmental peacebuilding framework, in order to move it forward: Firstly, the terminology of the concept is clarified, arguing that the interchangeable use of peacemaking and peacebuilding is problematic because these two terms refer to two distinct set of objectives and activities. Secondly, the specific qualities of environmental cooperation as a peacebuilding tool, in contrast to other domains, are discussed. Thirdly, the main actors which are implicated in environmental peacebuilding activities and their respective roles as reconciliation agents are debated.

3.1.Environmental peacemaking or peacebuilding?

Many authors use environmental peacemaking and peacebuilding interchangeably. This is partly because the timeframe to which each of these terms refers is unclear. While Carius (2007) notes that environmental cooperation is predominantly implemented during periods of low violence intensity, there is no clear-cut separation between conflict and peace, especially in the case of protracted conflicts where periods of acute violence alternate with latent phases. This might explain the confusion between peacemaking, which is traditionally seen as activities that are implemented to end a conflict, and post-conflict peacebuilding.

However, there is an important difference in the objectives that are pursued by peacemaking and peacebuilding, respectively, as well as the types of activities they imply. The two notions are thus not interchangeable. According to Galtung (1996), the central aim of peacebuilding is not to eliminate all forms of conflict, because conflict is a natural part of life. Instead, peacebuilding aims at creating the conditions under which conflicts can be solved non-violently, a state referred to by Galtung as “positive peace”. As such, positive peace goes beyond the absence of conflict, and is defined as the capacity to resolve conflicts in a non-violent way (Galtung, 1996). While peacemaking aims at deescalating the violence level (negative peace), peacebuilding aims to secure lasting (positive) peace. In other words, the objective pursued by peacemaking is the absence of violent conflict, while that of peacebuilding is sustainable peace and reconciliation between former conflict parties. This is achieved by solving the root causes of the violence. Hence, conflicts and change will continue to occur, but will be dealt with in a peaceful and cooperative way. What differentiates environmental peacebuilding from environmental peacemaking is, thus, not the conflict stage at which they both occur, but rather their ultimate objectives and the nature of the activities which are implemented in order to achieve them.

We have seen that conflicts are complex, multifaceted processes, and there is a need for a more comprehensive approach to conflict transformation than that which is envisioned by the environmental peacemaking framework. The definition of environmental peacemaking as “a continuum ranging from the absence of violent conflict to the unimaginability of violent conflict” (Conca and Dabelko, 2002) should thus be nuanced, as the second part refers to peacebuilding as we understand it. This does not mean that environmental peacemaking does not exist, but simply that it refers to a more limited framework than that of peacebuilding. When environmental cooperation is used as a means to foster trust and dialogue between communities, thereby deterring future conflicts and impacting sustainable development, we argue that this corresponds to environmental peacebuilding. Accordingly, environmental peacebuilding measures should be implemented when relevant: in the pre-conflict phase to prevent an escalation of latent violence, during a conflict to support a smooth transition to peace, and in the post-conflict phase to ensure sustainable peace (Conca et al., 2005).

3.2.Why the environment?

Natural resources are just one of many other issues around which peacebuilding can be articulated. Other issues include, for example, business initiatives, justice, or health. Nonetheless, the biophysical environment has distinctive qualities which potentially strengthen peacebuilding efforts and offers a broad range of types of actions. There is indeed a variety of activities that can bring different communities to collaborate non-violently using the natural environment. Environmental cooperation can, for instance, take the shape of transboundary water agreements, joint research projects, education, or peace parks which promote biodiversity conservation and eco-tourism. It appears from the literature, however, that some types of natural resources are more likely to result in cooperation than others, and that some types of cooperation are easier to implement than others. Depending on the local needs and socio-economic context, the environment and natural resources can thus be a more or less suited peacebuilding tool. However, more detailed quantitative and qualitative data are needed to further investigate which type of environmental cooperation is best suited and in what contexts.

One of the main assets of the biophysical environment as a cooperation incentive is the interdependence created by transboundary natural resources that are shared between actors at various spatial scales, from local communities to nation-states and global organisations. Indeed, environmental problems (and benefits) do not stop at political borders (Carius, 2007). Instead, natural resources spread across territories, creating “bioregions” (Kyrou, 2007). This interdependence can exacerbate existing tensions, but also creates cooperation opportunities. It calls for cross-border regional forms of management (FoEME, 2008).

Moreover, environmental cooperation is often more cost-effective than conflict for all parties (Kramer et al., 2013, Wolf, 2007). Regarding the latter, Wolf et al. (2005) note that a main reason why riparian countries are pushed towards negotiation instead of conflict is “to ensure access to this essential resource and its economic and social benefits”. The interdependencies created by shared natural resources, coupled with the cost-effectiveness of cooperation over conflict, thus create an incentive for cooperation. The ability to find arrangements to manage shared natural resources can even provide new income sources, supporting post-conflict economic recovery and the peacebuilding process (Matthew et al., 2009). Nonetheless, it has also been noted that environmental cooperation can contribute to durable peace, regardless of whether the environment caused the conflict in the first place (Ali, 2007). The environmental peacebuilding framework can also be seen as an entry point for broader cooperation in other areas, ultimately restoring peaceful relationships (Matthew et al., 2009, Amster, 2015). In regard to this, Maas, Carius, and Wittich (2013) claim that “environmental issues are often lower on the political agenda” and may as such “provide a good entry point for dialogue and cooperation”.

#### No resource wars – alternate variabilities and institutional buffers intervene – consensus of best studies

Koubi et al 14 [Vally Koubi (senior scientist at the Center for Comparative and International Studies, coordinator of Climate Change, Economic Growth, and Conflict at the Swiss Network for International Studies, professor at the Institute of Economics at the University of Bern, Ph.D. in Political Science from the University of Rochester), Gabriele Spilker (assistant professor of International Political Economy at the University of Salzburg), Tobias Bӧhmelt (Professor of Government at the University of Essex), & Thomas Bernauer (Professor of Political Science at the ETH Zurich), “Do natural resources matter for interstate and intrastate armed conflict?”, Journal of Peace Research 2014, Vol. 51(2) 227–243, http://jpr.sagepub.com/content/51/2/227]

**Do natural resources lead to conflict, even full-scale wars?** What types of natural resources are robust predictors for the onset, intensity, and duration of interstate and intrastate armed conflict? This article reviews the existing literature on the resource–conflict nexus in view of these and related questions. While from an empirical lens this literature is based on qualitative comparative and single case studies as well as quantitative research, it theoretically focuses on two causal mechanisms that may relate resources to conflict: resource scarcity for renewable resources and resource abundance in the context of non-renewable resources. In this article, we follow this structure and start by discussing how the scarcity of renewable resources that tend to have a relatively low market value (e.g. cropland or water) may influence the onset, intensity, and duration of interstate and intrastate conflicts. This literature suggests that by depriving people of their livelihood, resource scarcity leaves them no choice but to fight for survival. However, **while early empirical, mainly qualitative studies found a positive relationship between resource scarcity and conflict,** **the quantitative work has been unable to establish such a connection**.1 We then elaborate on the problems of local abundance of non-renewable resources that tend to have a high market value (e.g. fossil fuels or gold). Studies focusing on this issue have developed several arguments about how non-renewable resources could affect conflict, primarily at the domestic level. For example, **resource abundance might increase the value of the state as a target of violence. It could also reduce the opportunity costs for rebellion** or increase grievances. Empirically, we find considerable evidence that natural wealth is indeed associated with certain types of conflict. We review the existing research in each of these areas, and conclude by highlighting and assessing some of the theoretical and empirical problems in existing research and by pointing to avenues for further research. Renewable resources, scarcity, and conflict: Theoretical arguments Following a neo-malthusian line of reasoning, several researchers posit that increasing scarcity of and decreasing access to renewable resources raise frustration, which in turn creates grievances against the state, weakens it and civil society, and leads to opportunities for insurrection (e.g. Homer-Dixon, 1994, 1999; Ba¨chler et al., 1996). Homer-Dixon (1999), for instance, identifies three ways2 in which renewable resources can become scarce, and he asserts that resource scarcity is more likely to provoke internal conflict than interstate war. Kahl (2008: 50f) adds that elites may abuse their power over access to resources in situations of scarcity. By manipulating state policies in their favor, elites can limit access to resources, thus contributing to conflict. Cornucopians or ‘resource optimists’ do not share the neo-malthusian view. Although they acknowledge that resource scarcity may put human well-being at risk, cornucopians claim that **humans are able to adapt to resource scarcity through market mechanisms, technological innovations, social institutions for resource allocation, or any combination thereof** (e.g. Lomborg, 2001). In the same vein, cornucopians criticize neo-malthusian arguments as overly deterministic and ignorant of economic (e.g. growth) and sociopolitical factors (e.g. political institutions) (e.g. Gleditsch, 1998; Theisen, 2008). Resource optimists instead suggest various causal mechanisms in which **scarcity is just one of several factors in the overall relationship** between natural resources and conflict. **Even in instances of acute resource scarcity** then, **conflict does not appear to be the automatic outcome.** And **if conflict occurs, resource** **scarcity is unlikely to be the main cause**, **which is supported by recent research showing that economic and political factors are more important drivers of conflict than resource scarcity** (e.g. Gartzke, 2012; Koubi et al., 2012; Buhaug, 2010). Renewable resources, scarcity, and conflict: Empirical evidence Much of the existing empirical work on the resource scarcity–conflict nexus relies on qualitative studies of specific countries or regions (e.g. Homer-Dixon, 1994, 1999; Percival & Homer-Dixon, 1998; Ba¨chler et al., 1996; Kahl, 2008; Brown, 2010). This research identifies various cases in which resource scarcity seems to have contributed to violent conflict, mostly at local or national levels. However, social, economic, and political conditions, which may also affect conflict besides resource scarcity, vary considerably between different types of resources as well as areas of the world. **Case studies of specific countries or regions can hardly account for these different conditions, and it is therefore** **difficult to generalize their results**. Hence, we concentrate on the recent large-N research in the remainder of this section, and structure the discussion according to conflict types, that is, interstate vs. intrastate conflict and the kind of resource under study. First, with regard to interstate conflict, extant quantitative work almost exclusively focuses on one specific type of renewable resource, namely water. **Empirical analyses** in this context **suggest that** **states tend to cooperate rather than fight over shared water resources** (Dinar et al., 2007; Brochmann, 2012) and that **institutionalized agreements can reduce dispute risk** (Zawahri & Mitchell, 2011; Tir & Stinnett, 2012). The theoretical underpinning of much of this research is that joint democracy and/or international water management institutions facilitate cooperative solutions to water problems even in situations of scarcity. Furthermore, **side-payments, issue linkages, or economic and political ties between countries also prevent interstate conflict** over water. While scholars do not fully rule out conflict over scarce water resources, they find that **if conflict materializes then** **it occurs in the form of disputes and political tensions, but not in the form of armed hostilities** or even ‘water wars’ (e.g. Gledisch & Hegre, 2000; Gleditsch et al., 2006; Hensel, Mitchell & Sowers, 2006; Brochmann & Hensel, 2009; Dinar, 2009). Second, with regard to intrastate conflict, quantitative studies examining the effects of resource scarcity have generated a wide range of empirical findings, which, however, do not allow for a clearcut conclusion. For example, Hauge & Ellingsen (1998) find that land degradation, freshwater scarcity, and deforestation all have positive and significant effects on the incidence of armed conflict (see also Raleigh & Urdal, 2007; Gizelis & Wooden, 2010). Theisen (2008), however, shows – more convincingly than Hauge & Ellingsen (1998) – that only very high levels of land degradation increase civil conflict risk, while **water scarcity has no effect at all**. In contrast, Hendrix & Glaser (2007) report that land degradation has no impact, whereas more water per capita actually increases the risk of civil conflict in subSaharan Africa. Urdal (2005, 2008) finds that a combination of land scarcity and high rates of population growth increases the risk of civil conflict to some extent, and that scarcity of agriculturally productive land is positively correlated with civil conflict when agricultural wages decline. Østby et al. (2011) do not obtain evidence for an effect of land pressure on violence in Indonesian provinces. Similarly, Theisen (2012) does not find that land pressure affects civil conflict in Kenya. Finally, Meier, Bond & Bond (2007) report that increased vegetation rather than scarcity is positively associated with the incidence of organized raids. In sum, **this** lack of robust statistical evidence **supporting the scarcity argument led Theisen** (2008: 810) **to conclude that ‘scarcity of natural resources has limited explanatory power in terms of civil violence’**. We tend to share this assessment and Table I gives an overview of the different studies discussed in the previous paragraphs. As demonstrated there, quantitative research on the link between renewable resources and conflict does not provide robust evidence for the claim that resource scarcity leads to intra- or interstate conflict. Some **large-N findings even strongly contradict common findings of earlier qualitative case studies.** Essentially, these results point to a more complex relationship between resource scarcity and conflict than most resource scarcity theorists currently envision. By and large, this assessment is in line with Gleditsch (1998) and Theisen (2008) who point to **several weaknesses of existing research**, **namely that it neglects the potential mediating roles of economic and political factors; it does not address issues of endogeneity; it selects on the dependent variable; and it is unclear about the appropriate level of analysis** (individual, household, subnational, or national).3