## 1AC

### Plan

#### Plan- States ought to prohibit the appropriation of outer space by private entities.

#### The plan clarifies customary law to ban private satellite mega-constellations that appropriate outer space and solves otherwise detrimental space debris.

Johnson 20 [Chris, Space Law Advisor for Secure World Foundation, 9 years of professional experience in international space law and policy. J.D. from New York Law School; 2020; “The Legal Status of MegaLEO Constellations and Concerns About Appropriation of Large Swaths of Earth Orbit,” <https://swfound.org/media/206951/johnson2020_referenceworkentry_thelegalstatusofmegaleoconstel.pdf>] brett

Yes, This Is Impermissible Appropriation

Article II of the Outer Space Treaty, discussed above, is clear on the point that the appropriation of outer space, including the appropriation of either void space or of celestial bodies, is an impermissible and prohibited action under international law. No means or methods of possession of outer space will legitimize the appropriation or ownership of outer space, or subsections thereof.

Excludes Others

The constellations above, because they seem to so overwhelmingly possess particular orbits through the use of multiple satellites to occupy orbital planes, and in a manner that precludes other actors from using those exact planes, constitute an appropriation of those orbits. While the access to outer space is nonrivalrous – in the sense that anyone with the technological capacity to launch space objects can therefore explore space – it is also true that orbits closer to Earth are unique, and when any actor utilizes that orbit to such an extent to these proposed constellations will, it means that other actors simply cannot go there.

To allow SpaceX, for example, to so overwhelmingly occupy a number of altitudes with so many of their spacecraft, essentially means that SpaceX will henceforth be the sole owner and user of that orbit (at least until their satellites are removed). No other actors can realistically expect to operate there until that time. No other operator would dare run the risk of possible collision with so many other spacecraft in that orbit. Consequently, the sole occupant will be SpaceX, and if “possession is 9/10th of the law,” then SpaceX appears to be the owner of that orbit.

Done Without Coordination

Additionally, SpaceX and other operators of megaconstellations are doing so without any real international conversation or agreement, which is especially egregious and transgressive of the norms of outer space. Compared to the regime for GSO, as administered by the ITU and national frequency administrators, Low Earth Orbit is essentially ungoverned, and SpaceX and others are attempting to seize this lack of authority to claim entire portions of LEO for itself; and before any international agreement, consensus, or even discussion is had. They are operating on a purely “first come, first served” basis that smacks of unilateralism, if not colonialism.

Governments Are Ultimately Implicated

As we know, under international space law, what a nongovernmental entity does, a State is responsible for. Article VI of the Outer Space Treaty requires that at least one State authorize and supervise its nongovernmental entities and assure their continuing compliance with international law. As such, the prohibition on nonappropriation imposed upon States under Article II of the Outer Space Treaty applies equally to nongovernmental private entities such as SpaceX.

Nevertheless, through the launching and bringing into use of the Starlink constellation, SpaceX will be the sole occupant, and thereby, possessor, both fact and in law, of 550 km, 1100 km, 1130 km, 1275 km, and 1325 km above our planet (or whatever orbits they finally come to occupy). The same is true for the other operators of these large constellations which will be solely occupying entire orbits.

Long-Term Occupation Constitutes Appropriation

These altitudes are additionally significant, as nonfunctional spacecraft in orbits lower than around 500 km will re-enter the Earth’s atmosphere in months or a few years, but the altitudes selected for the Starlink constellation, while technologically desirable for their purposes, also mean that any spacecraft which are not de-orbited from these regions may be there for decades, or possibly even hundreds of years. By comparison, the granting of rights for orbital slots at GSO is in 15-year increments, a length of time much less than what the altitudes of the megaconstellations threaten. Such long spans of time at these altitudes by these megaconstellations further bolster the contention that this occupation rises to the level of appropriation of these orbits.

Prevents Others from Using Space

Article I of the Outer Space Treaty establishes that the exploration and use of outer space is “the province of all mankind.” It further requires that this exploration and use shall be by all States “without discrimination of any kind, on a basis of equality and in accordance with international law...” However, when one private corporation so overwhelmingly possesses entire portions of outer space, their use is discriminatory to other potential users and interferes with their freedom to access, explore, and use outer space. So long as these actors are so dominantly possessing and occupying those orbits, their actions exclude others from using them. What other operator would dare use orbits where there are already hundreds of satellites operating as part of a constellation? It would be an extremely unwise and risky decision to try to share these orbits with a mega constellation, so they will likely choose other altitudes and orbits. This massive occupation of particular orbits effectively defeats others from enjoying the use of outer space. While a State can issue permits for one of its corporations allowing them to launch and operate satellites to this extent, that does not automatically mean that their activities in outer space, an area beyond national sovereignty, are therefore in perfect accordance with the strictures of international law. Indeed, national permissions offer no such guarantee.

No Due Regard for Others

That these megaconstellations violate the prohibition on appropriation in Article II is additionally supported by Article IX of the Outer Space Treaty. Article IX requires that in the exploration and use of outer space, States “shall be guided by the principle of cooperation and mutual assistance and shall conduct all their activities in outer space... with due regard to the corresponding interests of other States...” There is hardly any way to view this deployment of megaconstellations as showing any type of due regard to the corresponding interests of others. This lack of regard further supports the notion of their unilateral transgressive violations of the purposes of space law norms.

Harmful Contamination

The impacts of the spacecraft on the pressing issue of space debris need not be gone into detail here. Suffice it to say, megaconstellations threaten mega-debris. The failure rate of these comparatively cheap satellites should give pause, because if 5% of a constellation of 100 satellites fails, this is 5 guaranteed new pieces of debris intentionally introduced to the fragile space domain. Article IX of the Outer Space Treaty warns of harmful contamination of the space environment and requires States to take appropriate measures to prevent this harmful contamination. A responsible government could not, in all seriousness, permit the intentional release of such amounts of space debris, especially in the already fraught orbits that many megaconstellations are headed towards. While the threat of space debris is not directly relevant to the accusation of appropriation of outer space, it goes towards the argument that these actors are conducting activities in a manner lacking in regard to others, and in fact, amounts to excluding others from using the space domain. By excluding others, this has the effect of taking orbits for themselves, which IS occupation.

If This Isn’t Appropriation, Then What Is?

Arguing in the alternative, if these megaconstellations — in their dominant occupation of entire orbits in orbital planes with numerous satellites — could be considered (merely for the sake of argument) to not be appropriation, we must therefore ask: what would be appropriation? What use of void space, including orbits of the Earth, would constitute actual appropriation? What further, additional fact of these uses of space, if added to the scenario, would cause that constellation to cross over the line into clearly prohibited appropriation? Perhaps the exact same scenario, but supplemented with an actual, formal claim of sovereignty, issued by a government, is the only element which could be added to megaconstellations which would then cross the threshold into appropriation. However, a formal claim of sovereignty would be merely an act occurring on Earth and would not change any actual facts in the space domain. Consequently, the lack of a formal claim of sovereignty should not be the deciding criteria in arriving at the conclusion that megaconstellations constitute appropriation of orbits.

Conclusion

In conclusion, these megaconstellations effectively occupy entire orbital regions with their vast fleet of spacecraft and in so doing effectively preclude other actors from sharing those domains. They have done so, or are attempting to do so, without any international consensus or discussion, which is most egregious for a domain outside of State sovereignty and which no State can own. Governments will ultimately be responsible for this appropriation, and both are prohibited from appropriating space. In distinction to GSO, their permission to go there means that they could occupy these regions for incredibly long periods — which again shows their appropriation. These constellations significantly prevent others from using those regions, which therefore interferes with others’ right to explore and use space. And ultimately, this reckless ambition shows absolutely no due regard (as per Article IX) for the corresponding rights of others. As such, these megaconstellations constitute an impermissible appropriation of particular regions of outer space, regardless of any formal, official claim of such by a responsible, authorizing government.

### Advantage 1: Satellites

#### Incoming mega-constellations of satellites ensure unmanageable space debris, triggering the Kessler Syndrome.

Boley & Byers 21 [Aaron C., Department of Physics and Astronomy @ The University of British Columbia\*, and Michael, Department of Political Science @ The University of British Columbia; Published: 20 May 2021; Scientific Reports; “Satellite mega-constellations create risks in Low Earth Orbit, the atmosphere and on Earth,” <https://www.nature.com/articles/s41598-021-89909-7>] brett

Companies are placing satellites into orbit at an unprecedented frequency to build ‘mega-constellations’ of communications satellites in Low Earth Orbit (LEO). In two years, the number of active and defunct satellites in LEO has increased by over 50%, to about 5000 (as of 30 March 2021). SpaceX alone is on track to add 11,000 more as it builds its Starlink mega-constellation and has already filed for permission for another 30,000 satellites with the Federal Communications Commission (FCC)1. Others have similar plans, including OneWeb, Amazon, Telesat, and GW, which is a Chinese state-owned company2. The current governance system for LEO, while slowly changing, is ill-equipped to handle large satellite systems. Here, we outline how applying the consumer electronic model to satellites could lead to multiple tragedies of the commons. Some of these are well known, such as impediments to astronomy and an increased risk of space debris, while others have received insufficient attention, including changes to the chemistry of Earth’s upper atmosphere and increased dangers on Earth’s surface from re-entered debris. The heavy use of certain orbital regions might also result in a de facto exclusion of other actors from them, violating the 1967 Outer Space Treaty. All of these challenges could be addressed in a coordinated manner through multilateral law-making, whether in the United Nations, the Inter-Agency Debris Committee (IADC), or an ad hoc process, rather than in an uncoordinated manner through different national laws. Regardless of the law-making forum, mega-constellations require a shift in perspectives and policies: from looking at single satellites, to evaluating systems of thousands of satellites, and doing so within an understanding of the limitations of Earth’s environment, including its orbits.

Thousands of satellites and 1500 rocket bodies provide considerable mass in LEO, which can break into debris upon collisions, explosions, or degradation in the harsh space environment. Fragmentations increase the cross-section of orbiting material, and with it, the collision probability per time. Eventually, collisions could dominate on-orbit evolution, a situation called the Kessler Syndrome3. There are already over 12,000 trackable debris pieces in LEO, with these being typically 10 cm in diameter or larger. Including sizes down to 1 cm, there are about a million inferred debris pieces, all of which threaten satellites, spacecraft and astronauts due to their orbits crisscrossing at high relative speeds. Simulations of the long-term evolution of debris suggest that LEO is already in the protracted initial stages of the Kessler Syndrome, but that this could be managed through active debris removal4. The addition of satellite mega-constellations and the general proliferation of low-cost satellites in LEO stresses the environment further5,6,7,8.

Results

The overall setting

The rapid development of the space environment through mega-constellations, predominately by the ongoing construction of Starlink, is shown by the cumulative payload distribution function (Fig. 1). From an environmental perspective, the slope change in the distribution function defines NewSpace, an era of dominance by commercial actors. Before 2015, changes in the total on-orbit objects came principally from fragmentations, with effects of the 2007 Chinese anti-satellite test and the 2009 Kosmos-2251/Iridium-33 collisions being evident on the graph.

Figure 1

[Figure 1 omitted]

Cumulative on-orbit distribution functions (all orbits). Deorbited objects are not included. The 2007 and 2009 spikes are a Chinese anti-satellite test and the Iridium 33-Kosmos 2251 collision, respectively. The recent, rapid rise of the orange curve represents NewSpace (see "Methods").

Full size image

Although the volume of space is large, individual satellites and satellite systems have specific functions, with associated altitudes and inclinations (Fig. 2). This increases congestion and requires active management for station keeping and collision avoidance9, with automatic collision-avoidance technology still under development. Improved space situational awareness is required, with data from operators as well as ground- and space-based sensors being widely and freely shared10. Improved communications between satellite operators are also necessary: in 2019, the European Space Agency moved an Earth observation satellite to avoid colliding with a Starlink satellite, after failing to reach SpaceX by e-mail. Internationally adopted ‘right of way’ rules are needed10 to prevent games of ‘chicken’, as companies seek to preserve thruster fuel and avoid service interruptions. SpaceX and NASA recently announced11 a cooperative agreement to help reduce the risk of collisions, but this is only one operator and one agency.

Figure 2

[Figure 2 omitted]

Orbital distribution and density information for objects in Low Earth Orbit (LEO). (Left) Distribution of payloads (active and defunct satellites), binned to the nearest 1 km in altitude and 1° in orbital inclination. The centre of each circle represents the position on the diagram, and the size of the circle is proportional to the number of satellites within the given parameter space. (Right) Number density of different space resident objects (SROs) based on 1 km radial bins, averaged over the entire sky. Because SRO objects are on elliptical orbits, the contribution of a given object to an orbital shell is weighted by the time that object spends in the shell. Despite significant parameter space, satellites are clustered in their orbits due to mission requirements. The emerging Starlink cluster at 550 km and 55° inclination is already evident in both plots (Left and Right).

Full size image

When completed, Starlink will include about as many satellites as there are trackable debris pieces today, while its total mass will equal all the mass currently in LEO—over 3000 tonnes. The satellites will be placed in narrow orbital shells, creating unprecedented congestion, with 1258 already in orbit (as of 30 March 2021). OneWeb has already placed an initial 146 satellites, and Amazon, Telesat, GW and other companies, operating under different national regulatory regimes, are soon likely to follow.

Enhanced collision risk

Mega-constellations are composed of mass-produced satellites with few backup systems. This consumer electronic model allows for short upgrade cycles and rapid expansions of capabilities, but also considerable discarded equipment. SpaceX will actively de-orbit its satellites at the end of their 5–6-year operational lives. However, this process takes 6 months, so roughly 10% will be de-orbiting at any time. If other companies do likewise, thousands of de-orbiting satellites will be slowly passing through the same congested space, posing collision risks. Failures will increase these numbers, although the long-term failure rate is difficult to project. Figure 3 is similar to the righthand portion of Fig. 2 but includes the Starlink and OneWeb mega-constellations as filed (and amended) with the FCC (see “Methods”). The large density spikes show that some shells will have satellite number densities in excess of n=10−6 km−3.

Figure 3

[Figure 3 omitted]

Satellite density distribution in LEO with the Starlink and OneWeb mega-constellations as filed (and amended) with the FCC. Provided that the orbits are nearly circular, the number densities in those shells will exceed 10–6 km−3. Because the collisional cross-section in those shells is also high, they represent regions that have a high collision risk whenever debris is too small to be tracked or collision avoidance manoeuvres are impossible for other reasons.

Full size image

Deorbiting satellites will be tracked and operational satellites can manoeuvre to avoid close conjunctions. However, this depends on ongoing communication and cooperation between operators, which at present is ad hoc and voluntary. A recent letter12 to the FCC from SpaceX suggests that some companies might be less-than-fully transparent about events13 in LEO.

Despite the congestion and traffic management challenges, FCC filings by SpaceX suggest that collision avoidance manoeuvres can in fact maintain collision-free operations in orbital shells and that the probability of a collision between a non-responsive satellite and tracked debris is negligible. However, the filings do not account for untracked debris6, including untracked debris decaying through the shells used by Starlink. Using simple estimates (see “Methods”), the probability that a single piece of untracked debris will hit any satellite in the Starlink 550 km shell is about 0.003 after one year. Thus, if at any time there are 230 pieces of untracked debris decaying through the 550 km orbital shell, there is a 50% chance that there will be one or more collisions between satellites in the shell and the debris. As discussed further in “Methods”, such a situation is plausible. Depending on the balance between the de-orbit and the collision rates, if subsequent fragmentation events lead to similar amounts of debris within that orbital shell, a runaway cascade of collisions could occur.

Fragmentation events are not confined to their local orbits, either. The India 2019 ASAT test was conducted at an altitude below 300 km in an effort to minimize long-lived debris. Nevertheless, debris was placed on orbits with apogees in excess of 1000 km. As of 30 March 2021, three tracked debris pieces remain in orbit14. Such long-lived debris has high eccentricities, and thus can cross multiple orbital shells twice per orbit. A major fragmentation event from a single satellite could affect all operators in LEO.

Even if debris collisions were avoidable, meteoroids are always a threat. The cumulative meteoroid flux15 for masses m > 10–2 g is about 1.2 × 10–4 meteoroids m−2 year−1 (see “Methods”). Such masses could cause non-negligible damage to satellites16. Assuming a Starlink constellation of 12,000 satellites (i.e. the initial phase), there is about a 50% chance of 15 or more meteoroid impacts per year at m > 10–2 g. Satellites will have shielding, but events that might be rare to a single satellite could become common across the constellation.

One partial response to these congestion and collision concerns is for operators to construct mega-constellations out of a smaller number of satellites. But this does not, individually or collectively, eliminate the need for an all-of-LEO approach to evaluating the effects of the construction and maintenance of any one constellation.

#### Scenario 1 is Water Wars

#### Sats key to stop water wars- biggest risk of war

Givetash ’18 (Linda Givetash, Canadian-South African journalist based in London, U.K., NBC News, “Early-warning tools aim to prevent 'water wars,' curb droughts”, <https://www.nbcnews.com/news/world/early-warning-tools-aim-prevent-water-wars-curb-droughts-n917001>, December 25, 2018) //Aryan

Water scarcity is a global security risk. Researchers are developing ways to forecast risks to prevent conflicts. LONDON — In a year of extreme heat and water-related tensions, researchers are trying to develop an early-warning system to prevent the devastating consequences of droughts that exacerbate geopolitical tensions. The Water, Peace and Security partnership aims to find better methods to monitor risks and trigger early interventions. Such technology is necessary as climate change amplifies water shortages plaguing countries across the globe. Related NEWS 'Island of Peace' faces uncertain future as Mideast grapples with water scarcity The U.S. Department of Defense has warned that water scarcity is a global security threat because it drives instability that can lead to wider terrorism and violence. The partnership — formed earlier this year by academics in Europe and the U.S. — aims to pinpoint locations where water crises and other overlapping vulnerabilities could stir conflicts. "The idea is to identify hotspots early enough so policy action can be taken before something escalates into violence," said Susanne Schmeier, a lecturer in water law and diplomacy at IHE Delft and coordinator of the partnership. Schmeier cautioned against labeling events as "water wars," explaining that there’s no evidence to suggest water scarcity directly triggers war. But it can compound tensions in regions wracked with political instability or poverty. Water scarcity has been attributed to playing a role in Syria’s civil war and the spread of militant groups such as Boko Haram in the Lake Chad basin. The warning system being developed uses a range of data including hydrological information and satellite imaging to monitor and calculate risks to water access around the globe. To determine the risk for conflicts, it tracks media reports in more than 100 languages by flagging a list of keywords in real time. The data has limitations. Satellite imaging runs into challenges with cloud cover or certain topographical characteristics, said Karen Meijer, a researcher at the Dutch institute Deltares that develops tools to monitor water resources. Related NEWS An island nation in the Mediterranean Sea is running dry The figures needed may not exist or be outdated, since the system largely relies on publicly available "open" data, Meijer said. Governments withholding data about reservoirs andother infrastructure may also prove to be a challenge. The warning-system tool is being trained to consider the many combinations of conflict-triggering factors from weak governments to local disputes to identify potential flashpoints. The findings it generates will not be as thorough as a scientific study for regions flagged as potential hotspots, Meijer said, but it will help those in power to make informed decisions. “International policy action is quite often driven by short-term considerations,” Schmeier said. Building more wells in response to a looming drought appears logical, she said, as an example. But those wells could have negative impacts, fueling animosity by seemingly prioritizing one community over others or dangerously depleting the resource — interconnected issues that the warning system aims to expose. Drought forecasting has become increasingly accurate for periods of six months into the future for many regions. It played an important role in mitigating the effects of drought in Ethiopia and Kenya in 2015, according to Micha Werner, associate professor in hydraulic engineering at IHE Delft. But forecasts were less effective in Somalia which didn’t have similar capacities to take action. Related WORLD NEWS The Dead Sea is dying. A $1.5 billion plan aims to resurrect it. Droughts can cost countries billions of dollars, so even a 10 percent reduction on the impact is beneficial, he said. “But you need the political will to do that.” Forecasters have warned that the coming year could be particularly bad for Australia, southern Africa and much of northern South America, thanks to predictions of a weak El Nino weather system for 2019. Colombia's Environment Minister Ricardo Lozano has called for action, warning that the phenomenon could cause rainfall deficits of up to 80 percent there in the first three months of next year. He warned that could result in more forest fires, failed crops, and water shortages that may force rationing. El Nino has already delayed the rainy season for eastern Africa and resulted in a shortfall of rain in southern countries including Zambia, Zimbabwe, Botswana and South Africa. It follows persistent dry conditions that contributed to Cape Town's "Day Zero" scare. How a three-year drought changed life in Cape Town MAY 20, 201801:55 The phenomenon could result in inconsistent rainfall for the Horn of Africa, bringing downpours and floods or extend dry conditions. To prepare for the worst, Henry Karemeri Ndungu, climate change specialist for the International Federation of Red Cross and Red Crescent Societies in Kenya, said the organization maintains a stockpile of supplies and evacuation facilities. In southern Africa, the Red Cross and its partners are also monitoring and preparing for food shortages caused by drought. “The mantra is prevention is better than cure,” Ndungu said.

#### Water triggers ME conflict

O’Connor ’18 (Tom O’Connor is a staff writer for newsweek specializing in the Middle East, North Korea and other foreign conflicts <https://www.newsweek.com/war-water-syria-iraq-turkey-will-next-fight-rivers-report-says-1046349>.Newsweek. 07/27/18)

The **next war in the Middle East could be fought over water as Iraq, Syria and Turkey scramble to assert claims to two vital rivers that run through the region**, according to a new report. Nabil al-Samman, a Syrian expert on international waters, made the case for an upcoming "water war" in an article published Friday by Saudi newspaper [Asharq Al-Awsat](https://aawsat.com/home/article/1344671/%D8%A7%D9%84%D8%B5%D8%B1%D8%A7%D8%B9-%D8%B9%D9%84%D9%89-%D9%85%D8%B5%D8%A7%D8%AF%D8%B1-%D8%A7%D9%84%D9%85%D9%8A%D8%A7%D9%87-%C2%AB%D8%B9%D9%82%D8%AF%D8%A9%C2%BB-%D8%A7%D8%B6%D8%A7%D9%81%D9%8A%D8%A9-%D8%A8%D9%8A%D9%86-%D8%A3%D9%86%D9%82%D8%B1%D8%A9-%D9%88%D8%AF%D9%85%D8%B4%D9%82-%D9%88%D8%A8%D8%BA%D8%AF%D8%A7%D8%AF). The article defines the term as being used to refer in the Mediterranean to "the use of water as a weapon in order to control its sources, or the diversion of water as a commercial commodity controlled by powerful upstream states for political ends." The piece outlines a decades-long history of difficult relations and devastating conflicts that have set the stage for a potential [upcoming crisis between Syria, Iraq and Turkey](https://www.newsweek.com/wars-water-97215). "When the sounds of guns and war drums fade in Syria and Iraq, new tensions may arise because of water, especially in their conflict with Turkey, from which the Euphrates and Tigris rivers flow," the report read. In eastern Syria's Euphrates River Valley, drought and mismanaged government policies [helped fuel support for protests](https://www.newsweek.com/climate-change-helped-create-conditions-war-syria-study-suggests-311199) that eventually morphed into a 2011 nationwide insurrection backed by the West, Turkey and Gulf Arab states. The subsequent insurgency and Syrian military's campaign backed, by Russia and Iran, to retake the country has left critical water infrastructure in ruins. Across the border in western Iraq, 15 consecutive years of war and insurgency following the 2003 U.S. invasion have left a similarly dire situation, but Turkey retains a powerful, controversial hold on the region's natural resources. A member of the U.S.-backed Syrian Democratic Forces, made up of an alliance of Arab and Kurdish fighters, splashes water at Lake Assad, an enormous reservoir created by the Tabqa dam, April 29, 2017. After having taken the dam from ISIS, the group's political wing is negotiating to returning it to the Syrian government's control. Just as the Syrian and Iraqi governments appear to be regaining a grasp of their respective countries, **Turkey has pushed forward with the**[**Southeastern Anatolia Project**](https://www.newsweek.com/2015/05/01/world-will-soon-be-war-over-water-324328.html), an ambitious initiative to build 22 dams and 19 power plants that **could curb water flow into the downstream states by as much as half**. The idea was originally crafted by the modern founder of Turkey, Mustafa Kemal Atatürk—and current Turkish President Recep Tayyip Erdogan has sought to cement the project's completion. For decades, the project stirred tensions between the neighboring countries, but political disputes have prevented negotiations from ever making progress. In addition to differences over the amount of water that would flow into Syria, the two countries have also quarreled over Damascus's claims to Turkey's southwestern Hatay Province and over Syria's alleged protection of Kurdish separatists that have waged war on the Turkish state. After holding talks in 1962, both countries began rounds of negotiations over water distribution that progressed as relations improved when Syrian President Bashar al-Assad took power in 2000. However, Turkey's support for Syrian rebels and ongoing occupation of parts of northern Syria have prevented the two from restarting talks. Syria and Iraq have their own long history of diplomatic failures that played out for decades as opposing factions of the Arab Socialist Ba'ath Party. The two governments also held talks in 1962 and attempted to settle find common ground over the Euphrates River that runs through their countries—and continued to do so through the 1990s. Since the U.S. ouster of Iraqi President Saddam Hussein, relations between Baghdad and Damascus have been enhanced. Iraq has attempted to maintain relations with both Syria and Turkey, but, [like Syria](https://www.newsweek.com/iraq-syria-win-wars-against-isis-us-turkey-will-not-leave-862653), has at times criticized Turkey for military incursions against Kurdish militias in Iraq. In what the article calls "the absence of an Iraqi-Syrian agricultural strategy," Ankara has maintained its dominance over the rivers. As the report notes, Turkey argues it's entitled to more water because its land is more fertile and has wielded control over the flow of the Euphrates and Tigris Rivers in the water-scarce Middle East, similar to the way in which the monarchies of the Gulf have exploited their vast, lucrative reserves of oil. Upon the opening of the Atatürk dam in 1992—a major part of the Southeastern Anatolia Project—the article quoted then-Turkish Prime Minister Suleyman Demirel proclaimed as saying: "The water that flows to Turkey from the Euphrates, Tigris and its tributaries is Turkish...We are not saying to Syria and Iraq that we share their oil resources...They have no right to say that they share our water resources." In Iraq, Turkey's construction of the Ilısu dam means the restarting of a pump at the Mosul Dam—which was recaptured from the Islamic State militant group (ISIS) in 2014—may not be enough to resuscitate the barren fields of the once-luscious Nineveh plains, as [Reuters](https://www.reuters.com/investigates/special-report/iraq-water-nineveh/) reported last month. [The Financial Times](https://www.ft.com/content/82ca2e3c-6369-11e8-90c2-9563a0613e56) further explored earlier this month how Iraq was racing to revamp its aging, damaged irrigation system to make up for anticipated losses in water flow to the Tigris River. In Syria, another former ISIS-held dam has become a major point of talks in the nation's ongoing civil war. The pro-Syrian government campaign has retaken most of the country, leaving only pockets of jihadi and rebel control, along with about a quarter in the hands of the U.S.-backed Syrian Democratic Forces. Unlike the largely Sunni Muslim Arab opposition, the mixed Arab-Kurdish Syrian Democratic Forces have [sought to negotiate with the government](https://www.newsweek.com/us-lost-war-syria-iran-russia-winning-final-battle-674833). On Friday, [a delegation of their political wing went to Damascus](https://www.newsweek.com/kurdish-forces-hold-talks-damascus-1045913) to discuss the transfer of control of key points, [including the Tabqa dam](https://www.newsweek.com/us-allies-syria-prepare-rebuild-ties-assad-after-trump-talk-putin-1029017), which lies on the banks of the Euphrates and Syria's largest reservoir, Lake Assad.

#### Triggers South Asian nuclear war

Baloch’18 (Tayyab Baloch, Asian security expert at Katehon, Katehon think tank is an independent organization consisting of an international network of people - from a wide variety of fields and disciplines - who specialize in the geopolitical, geostrategic and political analysis of world events. The group consists of political thinkers, international relations (IR) researchers, experts in security and counter-terrorism, and journalists concerned with international affairs, geopolitics, ethno-politics and inter-religious dialogue, “ASIAN WATER CRISES IN THE SHADOW OF NUCLEAR WAR”, <http://katehon.com/article/asian-water-crises-shadow-nuclear-war>, April 25, 2018)

The Indian government’s decision to scrap the Indus Water Treaty (IWT) of 1960 unilaterally shocked Pakistan as it failed to build dams on rivers at the lower riparian. This unexpected Indian action came after the Uri attack on Indian soldiers in Kashmir. In fact, Modi’s government in New Delhi is taking every step to isolate and terrorize Pakistan in response to Islamabad’s recent diplomatic effort to highlight the Kashmir issue. India has also become furious on the construction of thousands of dams by China in the Tibet Plateau on the upstream of the Indo-Gangetic Plain. India publicly considers Chinese dams on the upstream end as a water weapon against it. Therefore, India’s current water diplomacy hints that India is trying to unite “downstream” Asian nations to force Beijing to sign a trans-border water sharing treaty to counter its massive damming policies. India’s act of revoking the IWT is part of this effort for diplomatic pressure on Beijing to be accelerated for a new water treaty in the region. Water control in an upstream area could be used as a double-edged weapon against downstream countries. The current geopolitical scenario in South Asia can easily describe how upstream countries are using this in human practice against downstream countries. As China is building dams on freshwater resources in Tibet, the same India is working on hundreds of hydropower projects and dams in Kashmir on Pakistani rivers. Unfortunately, India has the first control of all 6 Indus water rivers of Pakistan which provided strategic advantages to India against Pakistan just as Chinese control over Tibet plateau waters provided strategic advantages to Beijing against other Asian nations. Historically, for the first time after the birth of Pakistan, India used the water weapon by stopping the supply of water from every canal flowing from India to Pakistan on April 1st, 1948. After the continuous protest of Pakistan, India agreed on an interim agreement with Pakistan on May 4th, 1948, but a permanent solution came in September 1960 when both countries signed the agreement known as the Indus Water Treaty. According to this treaty, Pakistan gained exclusive rights to three western rivers, namely the Indus, Jhelum and Chenab, while India retained rights to the eastern rivers, namely the Ravi, Beas and Sutluj. Unfortunately, India has not only built mega dams on Pakistani rivers such as the Indus, Chenab and Jhelum, but is also working to divert Pakistani rivers to India through massive tunnels. The first time that India publicly threatened to revoke IWT, it was India that practically breached the treaty through building disputed dams in occupied Kashmir on Pakistani rivers. In fact, India is working on a strategy to render Pakistan’s link-canal system redundant, destroy Pakistan’s agriculture, which is the country’s backbone, and turn Pakistan into a desert. India has no special rights to the Chenab River, but it has built 14 hydroelectric plants and is building more power projects which will enable it to block the entire water flow of Chenab for up to 20-25 days. This damming policy on the western river Chenab is an open violation of the treaty and provided strategic advantages to India against Pakistan, as these dams have provided India with the opportunity to use water as a weapon of mass destruction through releasing huge quantities of water downstream not only causing damage to standing crops, but also breaking canal systems. The Chenab River provides water to 21 canals and irrigates about 7 million acres of agricultural land in the Punjab province of Pakistan. Although the treaty restricted India from building gates for flushing silt out its dams, it has built gates on the Chenab and Jhelum River. These gates on dams increase Indian manipulation of the river’s flow, of which the Baglihar Dam on Chenab is an example. When India chose to fill Baghliar, it did such exactly at a time when the filling caused maximum damage to Pakistani farmers. According to a report, “Storage of water in Baglihar Dam reduced the flow of water in Chenab River during the sowing period of August to October and badly affected the agriculture sector of Pakistan. Pakistan lost thousands of cusecs of water; farmers could not irrigate their fields due to a shortage of water and resultantly more than 3.5 million agriculture tracts were left barren. The standing cotton, paddy crops of basmati rice of Kharif season in Punjab which were ripe were badly affected because of the absence of water.” Meanwhile, the Indian “Chutak” dam on the River Suru, (a major tributary of the Indus River in Indian-held Kashmir) has also become a direct threat to the Pakistani side of the Silk Road (Karakoram Highway also known as KKH). In the case of a dam collapse or deliberate release of a large quantity of water, the KKH between Basham and Jaglot would be washed out, which is also dangerous for the Pakistani-proposed Bhasha dam. This could also submerge the city of Skardu (a northern city of Pakistan) and its airport. Beside the Chenab and Jhelum rivers, India is also working on dams on the Indus River which can be described as a direct threat to Pakistan’s agriculture, because it is one of the longest rivers of the world which flows from Tibet Plateau and runs 400 km through China and about 300 km in Indian Ladakh and then enters into Pakistan with a total length of 3200 km. All rivers which flow in Pakistan meet with this mighty Indus river reaching its mouth in Arabian sea. A recent study entitled ‘Mountains of Concrete: Dam Building in the Himalayas’ warns that **Pakistan is on the brink of a water disaster**. There is the possibility that its water could plunge to 800 cubic meters per capita annually by 2020 from the current 1,200 cubic meters. Just 60 years ago, 5,000 cubic meters of water was available to every Pakistani citizen. Unlike India, Pakistan is highly dependent on agriculture and the Indus River’s unique irrigation system. Pakistan is 80% dependent on this irrigation. There is no doubt that agriculture is the mainstay of Pakistan's economy, as it accounts for 21% of GDP and, together with agro-based products, fetches 80% of the country’s total export earnings. More than 48% of the labour force is engaged in this sector. Therefore, being an agrarian country, Pakistan’s water issues with India are just as important as the UN’s resolutions on the Kashmir issue. In fact, these two are interlinked, as Kashmir is a lifeline for Pakistan. Hence why three wars between India and Pakistan have been fought over control of Kashmir and its water reservoirs. Pakistan has raised its voice against Indian damming policy on occupied Kashmir on Pakistan’s water. India has already constructed 50-60 medium-sized projects and it plans more than a hundred. This Indian policy shows that India wants to block every drop of Pakistan’s water. Pakistan's water issues with India are about just as important as the resolution of the Kashmir problem. In fact, the two are interlinked. Therefore, the resolution of the water issue should be part and parcel of any process of normalization between India and Pakistan. The Dul Hasti Hydroelectric Project, Salal Hydroelectric Project, Uri Hydroelectric Project - I & II, Kishanganga Hydropower project, Baglihar, Bursar, Kirthai, Sawalkot, Nimoo Bazgo, Dumkhar & Chutak dams and Wullar barrage are disputed dams and projects between Pakistan and India and they are all built on the western rivers to which Pakistan has exclusive rights. After India’s threat to revoke the water treaty, Pakistan should have also looked beyond IWT, because India has already violated it through building disputed dams on Pakistan’s water. The World Bank arbitration process should be reactivated to immediately stop the construction of disputed dams on the Indus, Chenab and Jhelum rivers. Like China, South Asian and East Asian countries are also facing water scarcity and all are dependent on Chinese control of the Tibet Plateau for freshwater. Tibet is the source of ten major Asian rivers upon which 25 percent of the world population depends. Therefore, it is known as Asia’s lifeline. But unfortunately, China’s massive damming policy in Tibet has become an open threat for severe water shortages in South Asia and Southeast Asia. Currently, China has 87000 dams and most of them are constructed in Tibet. What’s more, it has plans to build more dams and hydropower projects in the future to fulfill the needs of the country’s water-scare areas. Chinese dam building and water division plans along the Yarlung Zangbo, also known as the Brahmaputra in India, are a source of tension between China, India and Bangladesh. Despite the dams on South Asian Rivers, China is also working to build 21 more dams in addition to the 7 dams it has already built on the upper stream of the Mekong River (known as the Lancang in China) which is the main source of water for Southeast Asian nations. The Mekong crosses through Qinghai, Tibet, and Yunnan before flowing into Myanmar, Laos, Thailand, Cambodia, and Vietnam. Four riparian (downstream) countries, Laos, Cambodia, Vietnam and Thailand, had constituted the intergovernmental Mekong River Commission (MRC) to avoid conflict between Mekong basin countries through the promotion of sustainable management and water development for mutual benefit, while China has an observer status in MRC. China and the MRC directly dispute the construction of dams on the upper stream, but China has rejected all downstream concerns. However, due to diplomatic pressure by the Association of Southeast Asian Nations (ASEAN), China did agree to the Lancang-Mekong cooperation mechanism (LMCM) last year in November. International laws and conventions provide the first rights to water use to downstream countries on trans-border rivers, but unfortunately, China is the only country which does not adhere to this. Its damming policy has hinted that China is working only to fulfill its own national interests in facing severe water shortage challenges. One quarter of Chinese territory consists of deserts while, as a whole, it is an extremely arid country with the world’s largest population. But on other side, all Tibetan rivers which flow into South Asia and Southeast Asia have the most populated basins with mouths running into the South China Sea, the Bay of Bengal, and Arabian Sea. A Russian professor at Tomsk Polytechnic University and chief researcher of the Institute of Petroleum Geology and Geophysics, Stepan Svartsev, told TASS that water is a resource equal in value to oil, gas, and gold, and, sooner or later, we will start to sell it. We already sell it in stores and more and more people buy it. Water is becoming a commodity, and with time it will become more valuable than oil. We should be ready for this. It is also predicted that future wars will be fought over water and, unfortunately, **all border disputes between the Asian nuclear triangular (China, India and Pakistan) are based on water control reservoirs.** Now, as the world is tilting towards total war, the **tension in South Asia has increased as Pakistan threatens India with nuclear war** for blocking/diverting rivers which are directly linked with Kashmir. Moreover, Pakistan is already being subjected to Indian Hybrid War because it has given land access to China to reach the Arabian Sea, which is the mouth of Indus River. Indian efforts to counter China can easily be observed, as in its successful attempt to split up SAARC and bring the new cold war to South Asia. In fact, India is teaming up with South Asian and Southeast Asian countries against China by fueling water disputes. Hence why in South Asia, Bangladesh, who is totally dependent on Indian rivers, and Bhutan, who also has disputes with China, are supporting Indian diplomacy in isolating Pakistan, a move regionally aimed to counter China. Meanwhile, Pakistan, which is also fighting in the “Chinese war” in South Asia, has become the victim of the Indian water war against China. Chinese control over the roof of the world has given a unique, strategic position to Beijing to secure its water supply and future needs unilaterally. But in Pakistan’s case, the Indian threat to scrap the IWT unilaterally hints that India is going to adopt same of China’s water policies against Pakistan, as both have signed bilateral water sharing agreements for trans-border rivers. Unfortunately, Pakistan is living in a fool’s paradise if it really thinks India cannot annual and render the treaty void. In fact India has not only violated the treaty, but now it has continued to pursue its dream of making Pakistan docile in order to realize Indian ambitions. It is high time that China revisit its policy on Tibetan freshwater rivers upon which the populated Asian countries are dependent for their basic necessities and livelihoods. China still has not signed any multilateral treaties regarding shared tans-boundaries rivers, nor did it sign the 1997 UN Watercourses Convention that set the legal framework for rules and co-operation between more than 100 nations and their relevant international watercourses. On the one hand, China is working towards peaceful development and has created a “win-win” scenario for the revival of the ancient Silk Road through its proposed “Belt Road” initiative. But, on other side, it is going to block freshwater rivers which were part of ancient Silk Road. In other words, all Tibetan rivers are the branches of China’s Silk Road. Strategic control over Asian waters has also provided China with access to reach its maritime routes in the South China Sea, and Indian and Arabian oceans, which are the mouths of Tibetan rivers. Being the big brother of Asia, China should adopt a give-and-take policy and even help its friendly neighbor Pakistan through formulating multilateral or bilateral trans-border water co-operation rules and regulations, because Pakistan has become the victim of the same damming policy which the Chinese have launched in Tibet. A give-and-take policy could also help China clear its maritime routes involving the Bay of Bengal and South China Sea. In fact, the ball is in the Chinese court as it has appeared on the world stage as a leader of the multipolar world. But now, it is time to give up its selfish policy for the betterment of the multipolar nations of ASEAN and SAARC. If China can sign a shared water trans-border treaty with Russia for the Siberian Mighty Amur River’s water, then why can it not sign such treaty with Asian nations? It is true that every country in world must secure its own interests. But the massive damming policies of such Asian giants as China and India testifies to the fact that, sometimes, these individual interests must be sacrificed for the sake of mutual benefit and positive regional development. **If China is interested in saving Asia from nuclear war, it must come to the table to solve water disputes in Asia**. China has also become Pakistan’s last hope to save it from turning into a barren desert.

#### Scenario 2 is Agriculture

#### Satellite disruption undermines global food supply by crushing production

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Chapter 10: Remote Sensing: Environmental Monitoring and Science For over 30 years, we've been able to monitor global climate patterns and changes using satellite remote sensing. Much of what we've learned about the cycles that drive our climate and our technological civilization's impact on the global ecosystem has come from satellite observations. Without updated information from space, we would be [ruined] ~~crippled~~ in our ability to monitor atmospheric changes, global rainfall patterns, and other climatological indicators - leaving policy makers to make decisions without the most significant part of their data in hand. Satellite systems make regional and global resource monitoring possible. This is because it is very difficult and costly to conduct ground and aerial surveys over large areas and then to coordinate the individual surveys by joining them together. To collect data on a global scale, one must use the unique vantage point provided by space systems. One of the most successful applications of space imaging is monitoring the world's agricultural production, including identifying and differentiating most of the major crop types: wheat, barley, millet, oats, corn, soybeans, rice, and others. Feeding the world is only possible because of our ability to monitor food production and rapidly adapt to changes in the distribution system - and, in our modem world, both of these require space satellite systems. Satellite remote sensing has also been successfully used in identifying mineral resources, particularly when the data from various types of space-based sensors are combined and compared. Locating future sources of raw materials suddenly becomes much more difficult and costly without satellite data.

#### Digitalized agriculture enabled by satellites is the *only solution* to food insecurity

Prof. Dr. Nevin Demirbaş 18, professor, Department of Agricultural Economics, Ege University, “Precision Agriculture in Terms of Food Security : Needs for The Future,” <https://www.researchgate.net/publication/328655146_Precision_Agriculture_in_Terms_of_Food_Security_Needs_for_The_Future,> //Aryan

The current world population of 7.6 billion is expected to reach 8.6 billion in 2030, 9.8 billion in 2050 and 11.2 billion in 2100, according to United Nations (UN). With roughly 83 million people being added to the world’s population every year, the upward trend in population size is expected to continue, even assuming that fertility levels will continue to decline (UN, 2017). This means there will be an extra billion people to feed within the next decade. Continuing population and consumption growth will mean that the global demand for food will increase for at least another 50 years. A major correlate of this deceleration in population growth is increased wealth, and with higher purchasing power comes higher consumption and a greater demand for food, all of which add pressure to the food supply system (Godfray et al., 2010; FAO, 2017). At the same time, farmers are experiencing greater competition for land, water, and energy, and the need to curb the many negative effects of food production on the environmentis becoming increasingly clear. The effects of climate change are a further threat. But the world can produce more food and can ensure that it is used more efficiently and equitably (Thornton et al., 2009; Godfray and Garnett, 2014). There is a need for multi-faceted and linked strategies in which different components are explored to ensure sustainable and equitable food security at the global, regional and national level. At the same time, future’s food systems need to be resource efficient and sustainable. Efficient use of water, reduction of soil erosion and degradation to the minimum, minimization of energy input and maximization of yields under uncertain natural conditions are the goal (Hakkim et al., 2016). They pose highest requirements on the underlying information and knowledge infrastructure and make future farming a knowledge business and a very sophisticated management task (Bach and Mauser, 2018). Digitization has increased in importance for the agricultural sector and is described through concepts like Smart Farming (SF), Precision Farming (PF) and Precision Agriculture (PA). These type practices are sciences that is intertwined with several other emerging areas of research and practice (Zhou et al., 2017) such as digital agriculture, decision agriculture, smart agriculture, virtual agriculture, ‘Big-Data’ in agriculture, sustainable agriculture, agriculture 4.0, prescription farming and others (Yost et al., 2018). Technology like GPS, and, in particular, sensors are being used in field cultivation and livestock farming to undertake automatized agricultural management activities. PA or PF is generally defined as information and technology based farm management system to identify, analyse and manage spatial and temporal variability within fields for optimum productivity and profitability, sustainability and protection of the land resource by minimizing the production costs. Increasing environmental consciousness of the general public is necessitating us to modify agricultural management practices for sustainable conservation of natural resources such as water, air and soil quality, while staying economically profitable (Sonka and Cheng, 2015; Webber et al., 2017). Stakeholders, such as farmers, seed producers, machinery manufacturers, and agricultural service providers are trying to influence this process (Schönfeld et al., 2018). These practices are facilitating long-term improvements in order to achieve effective environmental protection. Despite all the positive contributions, the use of such technologies brings with it some controversial issues, particularly data protection.

#### U.S. collapse triggers worldwide food shocks – multiple hotspots escalate

Castellaw 17 – John Castellaw, National Security Lecturer at the University of Tennessee, Founder and CEO of Farmspace Systems LLC, Former President of the Crockett Policy Institute, Retired Lieutenant General in the United States Marine Corps, “Food Security Strategy Is Essential to Our National Security”, Agri-Pulse, 5-1, https://www.agri-pulse.com/articles/9203-opinion-food-security-strategy-is-essential-to-our-national-security

The United States faces many threats to our National Security. These threats include continuing wars with extremist elements such as ISIS and potential wars with rogue state North Korea or regional nuclear power Iran. The heated economic and diplomatic competition with Russia and a surging China could spiral out of control. Concurrently, we face threats to our future security posed by growing civil strife, famine, and refugee and migration challenges which create incubators for extremist and anti-American government factions. Our response cannot be one dimensional but instead must be a nuanced and comprehensive National Security Strategy combining all elements of National Power including a Food Security Strategy. An American Food Security Strategy is an imperative factor in reducing the multiple threats impacting our National wellbeing. Recent history has shown that reliable food supplies and stable prices produce more stable and secure countries. Conversely, food insecurity, particularly in poorer countries, can lead to instability, unrest, and violence. Food insecurity drives mass migration around the world from the Middle East, to Africa, to Southeast Asia, destabilizing neighboring populations, generating conflicts, and threatening our own security by disrupting our economic, military, and diplomatic relationships. Food system shocks from extreme food-price volatility can be correlated with protests and riots. Food price related protests toppled governments in Haiti and Madagascar in 2007 and 2008. In 2010 and in 2011, food prices and grievances related to food policy were one of the major drivers of the Arab Spring uprisings. Repeatedly, history has taught us that a strong agricultural sector is an unquestionable requirement for inclusive and sustainable growth, broad-based development progress, and long-term stability. The impact can be remarkable and far reaching. Rising income, in addition to reducing the opportunities for an upsurge in extremism, leads to changes in diet, producing demand for more diverse and nutritious foods provided, in many cases, from American farmers and ranchers. Emerging markets currently purchase 20 percent of U.S. agriculture exports and that figure is expected to grow as populations boom. Moving early to ensure stability in strategically significant regions requires long term planning and a disciplined, thoughtful strategy. To combat current threats and work to prevent future ones, our national leadership must employ the entire spectrum of our power including diplomatic, economic, and cultural elements. The best means to prevent future chaos and the resulting instability is positive engagement addressing the causes of instability before it occurs. This is not rocket science. We know where the instability is most likely to occur. The world population will grow by 2.5 billion people by 2050. Unfortunately, this massive population boom is projected to occur primarily in the most fragile and food insecure countries. This alarming math is not just about total numbers. Projections show that the greatest increase is in the age groups most vulnerable to extremism. There are currently 200 million people in Africa between the ages of 15 and 24, with that number expected to double in the next 30 years. Already, 60% of the unemployed in Africa are young people. Too often these situations deteriorate into shooting wars requiring the deployment of our military forces. We should be continually mindful that the price we pay for committing military forces is measured in our most precious national resource, the blood of those who serve. For those who live in rural America, this has a disproportionate impact. Fully 40% of those who serve in our military come from the farms, ranches, and non-urban communities that make up only 16% of our population. Actions taken now to increase agricultural sector jobs can provide economic opportunity and stability for those unemployed youths while helping to feed people. A recent report by the Chicago Council on Global Affairs identifies agriculture development as the core essential for providing greater food security, economic growth, and population well-being. Our active support for food security, including agriculture development, has helped stabilize key regions over the past 60 years. A robust food security strategy, as a part of our overall security strategy, can mitigate the growth of terrorism, build important relationships, and support continued American economic and agricultural prosperity while materially contributing to our Nation’s and the world’s security.

#### Scenario 3 is Blackout

#### Access to satellites solve every impact---collapse spills over to all other forms of critical infrastructure---specifically, destroys the power grid.

Pellegrino & Stang 16 --- Massimo Pellegrino, Master’s Degree in Space Studies from ISU, with Gerald Stang, Senior Associate Analyst at the EUISS, holds BSc and MSc degrees in chemical engineering from the University of Saskatchewan and an MA in international affairs from the School of International and Public Affairs at Columbia University (“Space Security for Europe”, *EU Institute for Security Studies*, published July 2016, <https://www.iss.europa.eu/content/space-security-europe>, accessed 7-10-2019) bm

Modern societies are highly dependent on the continuous operation of critical infrastructure to ensure the provision of basic goods and services. They consist of assets, systems or parts thereof which are so vital, that their disruption would significantly impact the economy, national security, public health, safety, or social well-being. Examples of critical infrastructure include energy, water, food supply, communication, transportation, and waste processing systems. Space assets are so deeply embedded in developed economies that a day without fully functioning space capabilities would severely restrict or even endanger our lives. Space systems are critical for running energy grids and telecommunication networks, border and maritime surveillance, crisis management and humanitarian operations, environmental and climate monitoring, verification of international treaties and arms control agreements, and the fight against organised crime and terrorism. Space assets also provide the technological backbone for other critical infrastructures. The synchronisation of power grids and telecommunication networks, for example, is heavily dependent on GNSS timing signals and any disruption would create a domino effect on other critical infrastructures (see Figure 5). Satellites also play a central role in supporting defence systems and military operations. They are force multipliers that provide intelligence, surveillance, and reconnaissance (ISR) capabilities, as well as communication, navigation, positioning and timing signals. Armed forces do not only use their own space systems, but are also significant consumers of space services provided by private operators. In fact, about 90% of US military communications traffic passes through civilian satellites, many of which privately owned, rather than through dedicated systems designed to withstand attempted interruptions.1 The reliance of both civilian and military users on space systems therefore places them firmly in the area of critical infrastructure. Some critical space systems, such as the American GPS, are under foreign control, and the governments controlling those systems retain the authority to disrupt services, even for allies, in case of a national emergency. While the United States announced that it has no intention of ever intentionally degrading public GPS signals (also known as ‘Selective Availability’) and that the next generation of GPS satellites will not include this feature, other governments might still do so.2 These dependences engender new and growing vulnerabilities. Reliance on space is likely to increase further as space capabilities and services improve in diversity, quality and affordability. Close to 1,500 satellites with a launch mass of over 50 kg are expected to be launched over the next decade; an increase of 50% compared to 2005-2014. This estimate excludes both the expected proliferation of smaller satellites (such as CubeSats), but also the planned OneWeb and Steam mega-constellations for global internet broadband service. Advances in small satellite capabilities and in launch technology (e.g. SpaceX’s Falcon rocket family) have already lowered the cost of access to space. About 45% more CubeSats were launched in 2014 than in 2013 (130 vs. 91), accounting for 63% of all satellites launched3 . However, just as the reliance on space increases, so too do threats and vulnerabilities. Therefore, in order to realise the full potential of investments in space, critical space systems need to be adequately protected and the space environment properly managed.

#### Grid collapse causes extinction.

Friedemann 16 --- Alice, transportation expert, founder of EnergySkeptic.com, citing Dr Peter Vincent Pry, executive director of the Task Force on National and Homeland Security, a Congressional advisory board dedicated to achieving protection of the United States from electromagnetic pulse and other threats, (“Electromagnetic pulse threat to infrastructure (U.S. House hearings)”, 1-24-2016, <http://energyskeptic.com/2016/the-scariest-u-s-house-session-ever-electromagnetic-pulse-and-the-fall-of-civilization/>)

Modern civilization cannot exist for a protracted period without electricity. Within days of a blackout across the U.S., a blackout that could encompass the entire planet, emergency generators would run out of fuel, telecommunications would cease as would transportation due to gridlock, and eventually no fuel. Cities would have no running water and soon, within a few days, exhaust their food supplies. Police, Fire, Emergency Services and hospitals cannot long operate in a blackout.Government and Industry also need electricity in order to operate. The EMP Commission warns that a natural or nuclear EMP event, given current unpreparedness, would likely result in societal collapse.

### FW

#### The standard is maximizing expected wellbeing.

#### Extinction comes first!

Pummer 15 [Theron, Junior Research Fellow in Philosophy at St. Anne's College, University of Oxford. “Moral Agreement on Saving the World” Practical Ethics, University of Oxford. May 18, 2015] AT

There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now, whatever general moral view we adopt: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war. How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that we – whether we’re consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world. According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here. If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how reducing existential risk is easily the most important thing in the whole world. This is for the familiar reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. There are so many possible future people that reducing existential risk is arguably the most important thing in the world, even if the well-being of these possible people were given only 0.001% as much weight as that of existing people. Even on a wholly person-affecting view – according to which there’s nothing (apart from effects on existing people) to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, this case is strengthened by the fact that there’s a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But that is a huge mistake. Non-consequentialism is the view that there’s more that determines rightness than the goodness of consequences or outcomes; it is not the view that the latter don’t matter. Even John Rawls wrote, “All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational, crazy.” Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good, from an impartial point of view. They’d thus imply very strong reasons to reduce existential risk, at least when this doesn’t significantly involve doing harm to others or damaging one’s character. What’s even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial “point of view of the universe,” indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. Even egoism, the view that each agent should maximize her own good, might imply strong reasons to reduce existential risk. It will depend, among other things, on what one’s own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don’t care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being. To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk. Add to all of this Samuel Scheffler’s recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I’d have very strong reason to reduce existential risk. We should also take into account moral uncertainty. What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts? I’ve just argued that there’s agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree. But even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one (and 10% sure that one of these other ones is correct), they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk. Perhaps most disturbingly still, even if we are only 1% sure that the well-being of possible future people matters, it is at least arguable that, from the standpoint of moral uncertainty, reducing existential risk is the most important thing in the world. Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. (For more on this and other related issues, see this excellent dissertation). Of course, it is uncertain whether these untold trillions would, in general, have good lives. It’s possible they’ll be miserable. It is enough for my claim that there is moral agreement in the relevant sense if, at least given certain empirical claims about what future lives would most likely be like, all minimally plausible moral views would converge on the conclusion that we should try to save the world. While there are some non-crazy views that place significantly greater moral weight on avoiding suffering than on promoting happiness, for reasons others have offered (and for independent reasons I won’t get into here unless requested to), they nonetheless seem to be fairly implausible views. And even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve. Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: “We live during the hinge of history. Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast. We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period. Our descendants could, if necessary, go elsewhere, spreading through this galaxy…. Our descendants might, I believe, make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly.” (From chapter 36 of On What Matters)