## 1st Off

**Xi’s regime is stable now, but its success depends on strong growth and private sector development.**

**Mitter and Johnson 21**

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**In China, however, growth has come in the context of stable communist rule,** suggesting that **democracy and growth are not inevitably mutually dependent**. In fact, **many Chinese believe that the country’s recent economic achievements**—**large-scale poverty reduction, huge infrastructure investment, and development as a world-class tech innovator**—have come about because of, not despite, China’s authoritarian form of government. Its **aggressive handling of Covid-19—in sharp contrast to that of many Western countries with higher death rates and later, less-stringent lockdowns—has, if anything, reinforced that view. China has also defied predictions that its authoritarianism would inhibit its capacity to** [**innovate**](https://hbr.org/2011/06/what-the-west-doesnt-get-about-china)**.** **It is a global leader in AI, biotech, and space exploration.** Some of its technological successes have been driven by market forces: People wanted to buy goods or communicate more easily, and the likes of Alibaba and Tencent have helped them do just that. But **much of the technological progress has come from a highly innovative and well-funded military that has invested heavily in China’s burgeoning new industries.** This, of course, mirrors the role of U.S. defense and intelligence spending in the development of Silicon Valley. **But in China the consumer applications have come faster, making more obvious the link between government investment and products and services that benefit individuals.** That’s why **ordinary Chinese people see Chinese companies such as Alibaba, Huawei, and TikTok as sources of national pride—international vanguards of Chinese success—rather than simply sources of jobs or GDP, as they might be viewed in the West.**

Thus July 2020 polling data from the Ash Center at Harvard’s Kennedy School of Government revealed 95% satisfaction with the Beijing government among Chinese citizens. Our own experiences on the ground in China confirm this. Most ordinary people we meet don’t feel that the authoritarian state is solely oppressive, although it can be that; for them it also provides opportunity. A cleaner in Chongqing now owns several apartments because the CCP reformed property laws. A Shanghai journalist is paid by her state-controlled magazine to fly around the world for stories on global lifestyle trends. A young student in Nanjing can study propulsion physics at Beijing’s Tsinghua University thanks to social mobility and the party’s significant investment in scientific research.

**Xi has committed to the commercial space industry as the linchpin of China’s rise – the aff is seen as a complete 180**

**Patel 21**

 [Neel V. Patel, Neel is a space reporter for MIT Technology Review. 1-21-2021, "China’s surging private space industry is out to challenge the US," MIT Technology Review,<https://www.technologyreview.com/2021/01/21/1016513/china-private-commercial-space-industry-dominance/> accessed 12/14/21] Adam

Until recently, China’s space activity has been overwhelmingly dominated by two state-owned enterprises: the China Aerospace Science & Industry Corporation Limited (CASIC) and the China Aerospace Science and Technology Corporation (CASC). A few **private space firms have been allowed to operate in the country for a while**: for example, there’s the China Great Wall Industry Corporation Limited (in reality a subsidiary of CASC), which has provided commercial launches since it was established in 1980. But for the most part, China’s commercial space industry has been nonexistent. Satellites were expensive to build and launch, and they were too heavy and large for anything but the biggest rockets to actually deliver to orbit. The costs involved were too much for anything but national budgets to handle. That **all changed this past decade as the costs of making satellites and launching rockets plunged.** In 2014, a year **after** **Xi Jinping took over as the new leader of China,** **[and] the Chinese government decided to treat civil space development as a key area of innovation,** as it had **already** **begun doing with AI and solar power**. It **issued a policy directive called** [**Document 60**](https://archive.md/o/bc9l4/www.cpppc.org/en/zy/994006.jhtml) **that year to enable large private investment in companies interested in participating in the space industry.** “**Xi’s goal was that if China has to become a critical player in technology, including in civil space and aerospace**, **it was critical to develop a space ecosystem that includes the private sector**,” says Namrata Goswami, a geopolitics expert based in Montgomery, Alabama, who’s been studying China’s space program for many years. “**He was taking a cue from the American private sector to encourage innovation from a talent pool that extended beyond state-funded organizations.”** As a result, there are **now 78 commercial space companies operating in China,** according to a [**2019 report by the Institute for Defense Analyses**](https://archive.md/o/bc9l4/https:/www.ida.org/-/media/feature/publications/e/ev/evaluation-of-chinas-commercial-space-sector/d-10873.ashx). More than **half have been founded since 201**4, and the vast majority focus on satellite manufacturing and launch services. For example, **Galactic Energy**, founded in February 2018, is building its Ceres rocket to offer rapid launch service for single payloads, while its Pallas rocket is being built to deploy entire constellations. Rival company **i-Space**, formed in 2016, became the first commercial Chinese company to make it to space with its Hyperbola-1 in July 2019. It wants to pursue reusable first-stage boosters that can land vertically, like those from SpaceX. So does **LinkSpace** (founded in 2014), although it also hopes to use rockets to deliver packages from one terrestrial location to another. **Spacety**, founded in 2016, wants to turn around customer orders to build and launch its small satellites in just six months. In December it launched a miniaturized version of a satellite that uses 2D radar images to build 3D reconstructions of terrestrial landscapes. Weeks later, it [**released the first images taken by the satellite**](https://archive.md/o/bc9l4/https:/spacenews.com/spacety-releases-first-sar-images/), Hisea-1, featuring three-meter resolution. Spacety wants to launch a constellation of these satellites to offer high-quality imaging at low cost.  To a large extent, **China is following the same blueprint drawn up by the US**: using **government contracts and subsidies to give these companies a foot** **up**. US firms like SpaceX benefited greatly from NASA contracts that paid out millions to build and test rockets and space vehicles for delivering cargo to the International Space Station. With that experience under its belt, SpaceX was able to attract more customers with greater confidence.  Venture capital is another tried-and-true route. **The IDA report estimates that VC funding for Chinese space companies was up to $516 million in 2018**—far shy of the $2.2 billion American companies raised, but **nothing to scoff at for an industry that really only began seven years ago**. At least **42 companies had no known government funding.** And much of the **government support these companies do receive doesn’t have a federal origin, but a provincial one**. “[These **companies**] are **drawing high-tech development to these local communities,**” says Hines. “And in return, **they’re given more autonomy by the local government.”** While most have headquarters in Beijing, many keep facilities in Shenzhen, Chongqing, and other areas that might draw talent from local universities.  There’s also **one advantage specific to China: manufacturing.** “What is the best country to trust for manufacturing needs?” asks James Zheng, the CEO of Spacety’s Luxembourg headquarters. “It’s **China. It’s the manufacturing center of the world.”** Zheng believes the **country is in a better position than any other to take advantage of the space industry’s new need for mass production of satellites and rockets alike.** Making friends The **most critical strategic reason to encourage a private space sector is to create opportunities for international collaboration**—particularly to **attract customers wary of being seen to mix with the Chinese government.** (US agencies and government contractors, for example, are barred from working with any groups the regime funds.) Document 60 and others issued by China’s National Development and Reform Commission were aimed not just at promoting technological innovation, but also at drawing in foreign investment and maximizing a customer base beyond Chinese borders. “**China realizes there are certain things they cannot get on their own**,” says Frans von der Dunk, a space policy expert at the University of Nebraska–Lincoln. Chinese companies like LandSpace and MinoSpace have worked to accrue funding through foreign investment, escaping dependence on state subsidies. And **by avoiding state funding, a company can also avoid an array of restrictions on what it can and can’t do** (such as constraints on talking with the media). **Foreign investment also makes it easier to compete on a global scale**: you’re **taking on clients around the world, launching from other countries, and bringing talent from outside China.** Although **China is taking inspiration from the US in building out its private industry,** the **nature of the Chinese state also means these new companies face obstacles that their rivals in the West don’t have to worry about**. While Chinese companies may look **private on paper**, they must **still submit to government guidance and control**, and accept some level of interference. It may be difficult for them to make a case to potential overseas customers that they are independent. The **distinction between companies that are truly private and those that are more or less state actors is still quite fuzzy**, especially if the **government is a frequent customer**. “That could still lead to a lack of trust from other partners,” says Goswami. It doesn’t help that the government itself is often [**very cagey about what its national program is even up to**](https://archive.md/o/bc9l4/https:/www.bbc.com/news/science-environment-54076895). And Hines adds that it’s **not always clear exactly how separate these companies are from, say, the People’s Liberation Army**, given the historical ties between the space and defense sectors. “Some of these things will pose significant hurdles for the commercial space sector as it tries to expand,” he says.

**Shifts in regime perception threatens CCP’s legitimacy from nationalist hardliners**

**Weiss 19**

 Jessica Weiss 1-29-2019 “Authoritarian Audiences, Rhetoric, and Propaganda in International Crises: Evidence from China”<http://www.jessicachenweiss.com/uploads/3/0/6/3/30636001/19-01-24-elite-statements-isq-ca.pdf> (Associate Professor of Government at Cornell University)//Elmer

**Public support**—or the appearance of it—**matters to many autocracies.** As Ithiel de Sola Pool writes, **modern dictatorships are “highly conscious of public opinion and make major efforts to affect it.”6 Mao Zedong told his comrades: “When you make revolution, you must first manage public opinion.”7 Because autocracies often rely on nationalist mythmaking,**8 success or failure in defending the national honor in international crises could **burnish the leadership’s patriotic credentials or spark opposition. Shared outrage at the regime’s foreign policy failures could galvanize street protests or elite fissures, creating intraparty upheaval or inviting military officers to step in to restore order. Fearing a domestic backlash, authoritarian leaders may feel compelled to take a tough international stance.** Although authoritarian leaders are rarely held accountable to public opinion through free and fair elections, fears of popular unrest and irregular **ouster often weigh heavily on autocrats seeking to maximize their tenure in office.** Considering the harsh consequences that authoritarian elites face if pushed out of office, **even a small increase in the probability of ouster could alter authoritarian incentives in international crises.**9 A **history of nationalist uprisings make Chinese citizens and leaders especially aware of the linkage between international disputes and domestic unrest.** The **weakness of the PRC’s predecessor in defending Chinese sovereignty** at the Paris Peace Conference in 1919 **galvanized protests and a general strike, forcing the government to sack three officials** and reject the Treaty of Versailles, which awarded territories in China to Japan. **These precedents have made Chinese officials particularly sensitive to the appearance of hewing to public opinion. As the People’s Daily chief editor wrote: “History and reality have shown us that public opinion and regime safety are inseparable.”10 One Chinese scholar even claimed: “the Chinese government probably knows the public’s opinion better and reacts to it more directly than even the U.S. government.”11**

**Xi will launch diversionary war to domestic backlash – escalates in multiple hotspots**

**Norris 17**

, William J. Geostrategic Implications of China’s Twin Economic Challenges. CFR Discussion Paper, 2017. (Associate professor of Chinese foreign and security policy at Texas A&M University’s Bush School of Government and Public Service)//Elmer

**Populist pressures might tempt the party leadership to encourage diversionary nationalism.** The logic of this concern is straightforward: the **Communist Party might seek to distract a restless domestic population with adventurism abroad.**19 The **Xi** administration **wants to appear tough in its defense of foreign encroachments against China’s interests.** This need stems from a long-running narrative about how a weak Qing dynasty was unable to defend China in the face of European imperial expansion, epitomized by the Opium Wars and the subsequent treaties imposed on China in the nineteenth century. **The party is particularly sensitive to perceptions of weakness because much of its claim to legitimacy—manifested in Xi’s Chinese Dream campaign today—stems from the party’s claims of leading the restoration of Chinese greatness.** For example, the May Fourth Movement, a popular protest in 1919 that helped catalyze the CPC, called into question the legitimacy of the Republic of China government running the country at that time because the regime was seen as not having effectively defended China’s territorial and sovereignty interests at the Versailles Peace Conference. **Diversionary nationalist frictions would likely occur if the Chinese leadership portrayed a foreign adversary as having made the first move**, thus **forcing Xi to stand up for China’s interests.** An example is the 2012 attempt by the nationalist governor of Tokyo, Shintaro Ishihara, to buy the Senkaku/Diaoyu Islands from a private owner.20 Although the Japanese central government sought to avert a crisis by stepping in to purchase the islands—having them bought and administered by Ishihara’s Tokyo metropolitan government would have dragged Japan into a confrontation with China—China saw this move as part of a deliberate orchestration by Japan to nationalize the islands. Xi seemingly had no choice but to defend China’s claims against an attempt by Japan to consolidate its position on the dispute.21 This issue touched off a period of heated tensions between China and Japan, lasting more than two years.22 Such dynamics are not limited to Japan. Other **possible areas of conflict include**, but are not necessarily limited to, **Taiwan, India, and the South China Sea (especially with the Philippines and Vietnam).** The Chinese government will use such tactics if it believes that the costs are relatively low. Ideally, China would like to appear tough while avoiding material repercussions or a serious diplomatic breakdown. Standing up against foreign encroachment—without facing much blowback—could provide Xi’s administration with a tempting source of noneconomic legitimacy. However, over the next few years, Xi will probably not be actively looking to get embroiled abroad. Cushioning the fallout from slower growth while managing a structural economic transition will be difficult enough. Courting potential international crises that distract the central leadership would make this task even more daunting. **Even if the top leadership did not wish to provoke conflict, a smaller budgetary allotment for security could cause** military interests in China to deliberately instigate trouble to justify their claims over increasingly scarce resources. For example, an air force interested in ensuring its funding for a midair tanker program might find the existence of far-flung territorial disputes to be useful in making its case. Such a case would be made even stronger by a pattern of recent frictions that highlights the necessity of greater air power projection. Budgetary pressures may be partly behind a recent People’s Liberation Army reorganization and headcount reduction. A slowing economy might cause a further deceleration in China’s military spending, thus increasing such pressures as budgetary belts tighten. Challenges to Xi’s Leadership Xi Jinping’s efforts to address economic challenges could fail, unleashing consequences that extend well beyond China’s economic health. For example, an economic collapse could give rise to a Vladimir Putin–like redemption figure in China. Xi’s approach of centralizing authority over a diverse, complex, and massive social, political, and economic system is a recipe for brittleness. Rather than designing a resilient, decentralized governance structure that can gracefully cope with localized failures at particular nodes in a network, a highly centralized architecture risks catastrophic, system-level failure. Although centralized authority offers the tantalizing chimera of stronger control from the center, it also puts all the responsibility squarely on Xi’s shoulders. With China’s ascension to great power status, the consequences of internecine domestic political battles are increasingly playing out on the world stage. The international significance of China’s domestic politics is a new paradigm for the Chinese leadership, and one can expect an adjustment period during which the outcome of what had previously been relatively insulated domestic political frictions will likely generate unintended international repercussions. Such dynamics will influence Chinese foreign policy and security behavior. Domestic arguments over ideology, bureaucratic power struggles, and strategic direction could all have ripple effects abroad. Many of China’s party heavyweights still employ a narrow and exclusively domestic political calculus. Such behavior increases the possibility of international implications that are not fully anticipated, raising the risks of strategic miscalculation on the world stage. For example, the factional power struggles that animated the Cultural Revolution were largely driven by domestic concerns, yet manifested themselves in Chinese foreign policy for more than a decade. During this period, China was not the world’s second largest economy and, for much of this time, did not even have formal representation at the United Nations. **If** today’s globally interconnected **China became engulfed in** similar **domestic chaos, the effects would be felt worldwide.23 Weakened Fetters of Economic Interdependence If China successfully transitioned away from its export-driven growth model toward a consumption-driven economic engine over the next four or five years, it could no longer feel as constrained by economic interdependence. To the extent that such constraints are loosened, the U.S.-China relationship will be more prone to conflict and friction**.24 While China has never been the archetypal liberal economic power bent on benign integration with the global economy, its export-driven growth model produced a strong strategic preference for stability. Although past behavior is not necessarily indicative of future strategic calculus, China’s “economic circuit breaker” logic seems to have held its most aggressive nationalism below the threshold of war since 1979. A China that is both comparatively strong and less dependent on the global economy would be a novel development in modern geopolitics. As China changes the composition of its international economic linkages, global integration could place fewer constraints on it. Whereas China has been highly reliant on the import of raw materials and semifinished goods for reexport, a consumption-driven China could have a different international trade profile. China could still rely on imported goods, but their centrality to the country’s overall economic growth would be altered. Imports of luxury goods, consumer products, international brands, and services may not exert a significant constraining influence, since loss of access to such items may not be seen as strategically vital. If these flows were interrupted or jeopardized, the result would be more akin to an inconvenience than a strategic setback for China’s rise. That said, China is likely to continue to highly depend on imported oil even if the economic end to which that energy resource is directed shifts away from industrial and export production toward domestic consumption.

**US–China war goes nuclear**

**Kulacki 20**

[Dr. Gregory Kulacki focuses on cross-cultural communication between the United States and China on nuclear and space arms control and is the China Project Manager for the Global Security Program at the Union of Concerned Scientists, 2020. Would China Use Nuclear Weapons First In A War With The United States?, Thediplomat.com, https://thediplomat.com/2020/04/would-china-use-nuclear-weapons-first-in-a-war-with-the-united-states/] srey

Admiral Charles A. Richard, the head of the U.S. Strategic Command, recently told the Senate Armed Service Committee he “could drive a truck” through the holes in China’s no first use policy. But when Senator John Hawley (R-MO) asked him why he said that, Commander Richard backtracked, described China’s policy as “very opaque” and said his assessment was based on “very little” information. That’s surprising. **China** has been **exceptionally clear about its intentions on the possible first use of nuclear weapons**. On the day of its first nuclear test on October 16, 1964, China declared it “will never at any time or under any circumstances be the first to use nuclear weapons.” **That unambiguous statement has been a cornerstone of Chinese nuclear weapons policy for 56 years and has been repeated frequently in authoritative Chinese publications for domestic and international audiences, including a highly classified training manual for the operators of China’s nuclear forces**. Richard should know about those publications, particularly the training manual. A U.S. Department of Defense translation has been circulating within the U.S. nuclear weapons policy community for more than a decade. The commander’s comments to the committee indicate a familiarity with the most controversial section of the manual, which, in the eyes of some U.S. analysts, indicates there may be some circumstances where **China would use nuclear weapons first in a war with the United States**. This U.S. misperception is understandable, especially given the difficulties the Defense Department encountered translating the text into English. The language, carefully considered in the context of the entire book, articulates a strong reaffirmation of China’s no first use policy. But it also reveals **Chinese military planners are struggling with crisis management and considering steps that could create ambiguity with disastrous consequences.** Towards the end of the 405-page text on the operations of China’s strategic rocket forces, in a chapter entitled, “Second Artillery Deterrence Operations,” the authors explain what China’s nuclear forces train to do if **“a strong military power possessing nuclear‐armed missiles and an absolute advantage in high‐tech conventional weapons is carrying out intense and continuous attacks against our major strategic targets and we have no good military strategy to resist the enemy.” The military power they’re talking about is the United States.** The authors indicate **China’s nuclear missile forces train to take specific steps, including increasing readiness and conducting launch exercises, to “dissuade the continuation of the strong enemy’s conventional attacks.”** **The manual refers to these steps as an “adjustment” to China’s nuclear policy and a “lowering” of China’s threshold for brandishing its nuclear forces.** Chinese leaders would only take these steps in extreme circumstances. The text highlights several triggers such as U.S. conventional bombing of China’s nuclear and hydroelectric power plants, heavy conventional bombing of large cities like Beijing and Shanghai, or other acts of **conventional warfare that “seriously threatened” the “safety and survival” of the nation**. U.S. Misunderstanding Richard seems to believe this planned adjustment in China’s nuclear posture means **China is preparing to use nuclear weapons first under these circumstances**. He told Hawley that there are a “number of situations where they may conclude that first use has occurred that do not meet our definition of first use.” The head of the U.S. Strategic Command appears to assume, as do other U.S. analysts, that the **Chinese would interpret these types of U.S. conventional attacks as equivalent to a U.S. first use of nuclear weapons against China**. But that’s not what the text says. “Lowering the threshold” refers to China putting its nuclear weapons on alert — it does not indicate Chinese leaders might lower their threshold for deciding to use nuclear weapons in a crisis. Nor does the text indicate Chinese nuclear forces are training to launch nuclear weapons first in a war with the United States. China, unlike the United States, keeps its nuclear forces off-alert. Its warheads are not mated to its missiles. China’s nuclear-armed submarines are not continuously at sea on armed patrols. The manual describes how China’s nuclear warheads and the missiles that deliver them are controlled by two separate chains of command. Chinese missileers train to bring them together and launch them after China has been attacked with nuclear weapons. All of these behaviors are consistent with a no first use policy. The “adjustment” Chinese nuclear forces are preparing to make if the United States is bombing China with impunity is to place China’s nuclear forces in a state of readiness similar to the state the nuclear forces of the United States are in all the time. This step is intended not only to end the bombing, but also to convince U.S. decision-makers they cannot expect to destroy China’s nuclear retaliatory capability if the crisis escalates. Chinese Miscalculation Unfortunately, alerting Chinese nuclear forces at such a moment could have terrifying consequences. Given the relatively small size of China’s nuclear force, a U.S. president might be tempted to try to limit the possible damage from a Chinese nuclear attack by destroying as many of China’s nuclear weapons as possible before they’re launched, especially if the head of the U.S. Strategic Command told the president China was preparing to strike first. One study concluded that if the **United States used nuclear weapons to attempt to knock out a small fraction of the Chinese ICBMs that could reach the United States it may kill tens of millions of Chinese civilians**. The authors of the text assume **alerting China’s nuclear forces would “create a great shock in the enemy’s psyche.”** That’s a fair assumption. But they also assume this shock could “dissuade the continuation of the strong enemy’s conventional attacks against our major strategic targets.” That’s highly questionable. **There is a substantial risk the United States would respond to this implicit Chinese threat to use nuclear weapons by escalating, rather than halting, its conventional attacks**. If China’s nuclear forces were targeted, it would put even greater strain on the operators of China’s nuclear forces. **A slippery slope to nuclear war** Chinese military planners are aware that attempting to coerce the United States into halting conventional bombardment by alerting their nuclear forces could fail. They also know it might trigger a nuclear war. But if it does, they are equally clear China won’t be the one to start it. Nuclear attack is often preceded by nuclear coercion. Because of this, in the midst of the process of a high, strong degree of nuclear coercion we should prepare well for a nuclear retaliatory attack. The more complete the preparation, the higher the credibility of nuclear coercion, the easier it is to accomplish the objective of nuclear coercion, and the lower the possibility that the nuclear missile forces will be used in actual fighting.

## 2nd Off

#### Mining solves Water Shortages

**Kean 15** Sam Kean December 2015 "The End of Thirst"<https://www.theatlantic.com/magazine/archive/2015/12/the-end-of-thirst/413176/> (writer based in Washington DC for the Atlantic)//Elmer

**Imagine turning on your tap and seeing no water come out**. Or looking down into your village’s only well and finding it dust-dry. Much of **the developing world** **could** soon **face such a scenario.** According to the United Nations, **1.2 billion** people already **suffer from** severe **water shortages**, and that number is **expected to increase to 1.8 billion** **over the next decade**, in part because of climate change. **Developed countries probably won’t be immune**. California and other states in the western U.S. are already experiencing extreme drought, and **climate experts warn of** even worse to come—multi-decade **megadroughts**. Mass migrations and wars over freshwater loom as real possibilities. Staving off disaster will require conservation, especially in agriculture, which consumes more than two-thirds of all the water humans use. Basic infrastructure maintenance would also go a long way: Some developing countries lose more than half their water through leaky pipes. But **conservation** and maintenance **won’t solve** all our water woes, especially as the planet warms and people continue to pack into cities. As a result, governments around the world are investing in new water-recycling and water-harvesting technologies. Here’s what the future of water might look like. 1. Drinking From the Sea … One obvious solution would be to drink ocean water. Converting seawater into freshwater by stripping out the salt—a process called desalination—offers several advantages. Roughly half the world’s population lives within 65 miles of an ocean, and saltwater accounts for about 97 percent of all water on Earth. Still, desalination presents obstacles. Older plants that boil seawater and collect the vapors, as many of those in the Middle East do, use ungodly amounts of energy. Newer plants that use reverse osmosis—whereby seawater is forced through membranes at high pressure—are more efficient, but still expensive and energy-intensive. The process also produces a briny waste that can harm marine life if not disposed of properly. We can nevertheless expect to see more desalination plants soon—thanks in part to Israel, which all but eliminated its chronic water shortages in the past decade by building four large reverse-osmosis plants, inspiring other countries to follow suit. A $1 billion plant operated by an Israeli company is about to open north of San Diego; it will be the largest in the Western Hemisphere, providing up to 50 million gallons of water a day to Californians. 2. … Or From the Toilet Instead of desalination, some experts favor recycling wastewater—cleaning the water from showers, washing machines, and, yes, toilets—for human consumption. Most water-recycling plants clean water in two basic ways. First, they force it through filters, some of which have holes hundreds of times narrower than a strand of human hair. These filters remove waste particles, organic chemicals, bacteria, viruses, and other dreck. Second, chemicals like hydrogen peroxide or ozone and pulses of ultraviolet light destroy any pathogens that have slipped through. Water recycling is a proven technology: California recycles hundreds of millions of gallons each day for irrigation and other uses. So what’s stopping recycled wastewater from going directly to our taps? Human psychology. The very idea of drinking it disgusts many people. They view such water as irredeemably dirty, little better than toilet water. In reality, recycled water is some of the cleanest drinking water around—as good as or better than the best bottled water. (Breweries in Oregon and California have plans to make beer with recycled water for this very reason—it’s so clean that it’s tasteless, a blank slate.) More to the point, recycled water is far purer than most tap water. By the time the water in the Mississippi reaches New Orleans, for instance, every drop has been used by cities along the river multiple times, and the treatment it gets before going through the taps is nowhere near as extensive as what a water-recycling plant provides. Singapore and Namibia have recycled water for years with no adverse health effects, and nasa began recycling water on the International Space Station in 2008. (The Russian cosmonauts there don’t recycle their pee, but they give the Americans bags of it to recycle and then drink.) In the United States, a few parched towns in Texas and New Mexico drink recycled wastewater already, and last year the city of San Diego—which gets most of its water from rivers that are running dry—approved a $3 billion recycling plant that would provide one-third of its tap water, 83 million gallons a day, by 2035. San Diego had rejected essentially the same plan in 1998, but this time the city decided it had no other choice. 3. Microbe Power Rather than filtering out organic waste, water-recycling plants might one day be able to break it down with microbes, a process that could bring an ancillary benefit: electric power. As they digest the gunk in wastewater, certain species of bacteria, called electricigens, can liberate electrons, the stuff of electricity. Producing electrons is actually common in nature—much of photosynthesis involves shuttling them around. Unlike plants, though, electricigens don’t store electrons internally. They use microscopic appendages that look like hairs to deposit the electrons onto external surfaces, usually minerals. In experimental fuel cells, scientists have replaced the minerals with wires and harvested electrons. Someday the bacteria might even generate enough power to run a water-recycling plant, making it self-sufficient. 4. Keeping It Simple Some up-and-coming water technologies are startlingly straightforward. People on arid plateaus, for instance, can string a fine plastic mesh between two posts and use it to capture water from fog that rolls through, collecting the drops in storage tanks. Existing systems in one small Guatemalan village can collect 6,300 liters a day, and more during the wet season. Scientists think that updating the mesh with new materials and tighter weaves could dramatically improve yields. People could even channel the water into hydroponic gardens to grow food. Imagine famously foggy San Francisco with a farm on every rooftop. Oil films present another low-tech opportunity. Reservoirs lose appalling amounts of water to evaporation: By some estimates, more water escapes into the air than is used by humans. But covering the surface with an extremely thin layer—even just one molecule thick—of nontoxic chemicals derived from coconut or palm oil can cut evaporative losses. Wind tends to break up layers of oil, re-exposing the water to the elements. But drones or blimps equipped with sensors could someday monitor reservoirs and signal where oil needed to be re-applied. In one recent test, spreading oil over a lake in Texas (via boats) appears to have cut evaporation by about 15 percent. 5. Making It Rain Of course, for every modest proposal to save water, there’s an audacious one floating around. Take weather modification. Advocates of the idea hope to significantly boost precipitation using a process called “cloud seeding”: spraying clouds with a chemical like silver iodide, which acts as a nucleus around which water droplets collect. The droplets then fall to Earth as rain or snow. That’s the theory, at least. The first large-scale experiments, in the 1940s, generated a lot of excitement. More recently, weather modification has been dogged by accusations of hype and questions about its reliability. A six-year program in Wyoming claimed to have squeezed 5 to 15 percent more precipitation out of the clouds it seeded. Unfortunately, conditions were suitable for seeding only 30 percent of the time, so the total increase in precipitation was closer to 3 percent. That’s not nothing, especially during droughts. But weather modification may be the flying car of water technology—a tantalizing idea that’s forever on the horizon. 6. The Moon Shot I**f Earth** does **run dry**, **we might** be able to **save ourselves by mining water from asteroids** and comets. Scientists have landed probes on these space rocks to study them. Future landers could mine them in deep space or possibly even drag them back toward Earth. Though the idea sounds far-fetched, space-mining companies already exist, and one of them, Planetary Resources, expects to start harvesting resources from asteroids in about a decade. According to Planetary Resources, **a single 1,600-foot-wide asteroid could yield** more platinum than has ever been mined in human history. But **water** could prove to be the real prize for space-mining companies. Some astronomers believe that **the asteroid Ceres**, which sits between Jupiter and Mars, may **contain** **more freshwater** (as ice) **than all of Earth does.** In addition to quenching people’s thirst, this water could be turned into fuel for interplanetary spaceships. In that case, an ample supply of water would be the key to a happy future not just down here on the ground, but up among the stars as well.

#### Water Wars cause:

#### a] Indo-Pak War – goes Nuclear

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Interstate conflict over water might occur, the ICA indicated, when several states rely on a shared river system for much of their water supply and one or more of the riparian states sought to maximize the river’s flow for their own benefit at the expense of other states in the basin, amplifying any scarcities already present there. “We judge that as water shortages become **more acute** beyond the next ten years, water in shared basins will **increasingly be used** as leverage,” the ICA stated. An upstream state enjoying superior control over a river’s flow might exploit its advantage, say, to extract advantage in international negotiations or to attract international aid for infrastructure projects. As the ICA further noted, “…we assess that states will also use their **inherent ability** to construct and support major water projects to obtain **regional influence** or preserve their water interests.”16

The utilization of a state’s superior position in a shared river system to extract political or economic advantage can prove **especially destabilizing**, the ICA suggested, when weaker states in the system (typically the downstream countries) are especially vulnerable to water scarcity because of long-standing social, economic, and political conditions. Without identifying any particular states by name, the study suggested that this could occur when downstream states suffer from endemic corruption, poor water management practices, and systemic favoritism when it comes to the allocation of scarce water supplies. In such cases, any reduction in the flow of water by an upstream country could easily combine with internal factors in a downstream country to provoke **widespread unrest** and conflict. “Water shortages, and government failures to manage them, are likely to lead to social disruptions, pressure on national and local leaders, and potentially political instability,” the report noted.17

Although most discussion of the climate and water security nexus has continued to emphasize the risk of internal conflict arising from warming-related water scarcities, some analysts have pursued the line of inquiry introduced by the 2012 ICA, focusing on interstate tensions arising within shared river basins. This was a prominent theme, for example, of a 2013 study conducted by the National Research Council (NRC) on behalf of the IC. Entitled Climate and Social Stress: Implications for Security Analysis, the 2013 NRC report sought to better identify the links between global warming, pre-existing social vulnerabilities, and the likelihood of conflict. While it echoed earlier studies by the CNA and NIC in identifying internal factors like poverty, ethnic discord, and governmental ineptitude as likely pre-conditions for climate-related conflict, it also examined dangers arising from dependence on shared river systems, especially in cases where cooperation among the riparian powers in managing the system is limited and global warming is expected to reduce future water flows.18

For the NRC, the river systems of greatest concern in this respect were those that originate in the Himalayan Mountains and depend, for a significant share of the annual flow, on meltwater from the Himalayan glaciers. These glaciers are an important source of meltwater for many of Asia’s major rivers, including the Indus, Ganges, Brahmaputra, and

Mekong Rivers. These rivers originate in China but travel through India, Pakistan, Nepal, Bangladesh, Laos, Cambodia, Thailand, and Vietnam—countries with a combined population of over 3.4 billion people, or approximately 44 percent of the world’s total population.19 A large share of the population in these countries depends on agriculture for its livelihood, so ensuring access to adequate supplies of water is a prime local and national priority. During the monsoon season, heavy rains provide these rivers with abundant water, but during dry seasons they are dependent on glacial meltwater—and, with the rise in global temperatures, the Himalayan glaciers are melting, jeopardizing future water availability in these river basins. Given a history of ethnic and social discord within many of these countries and long-standing tensions among them, analysts fear that such shortages could aggravate both internal and external tensions and ignite interstate as well as intrastate conflict.20

As was the case of previous IC-initiated studies, the authors of the 2013 NRC report were reluctant to identify specific countries in their findings, referring again to “countries of security concern” or other such euphemisms. However, they did select one of these countries in particular: Pakistan. They chose that country for special analysis, the report indicated, because “Pakistan presents a **clear example** of a country where social dynamics and susceptibility to harm from climate events combine to create a potentially unstable situation.”21 Pakistan was said to suffer from **multiple risk factors**: Its economy is largely dependent on agriculture; much of the water used for irrigation purposes comes from just one source, the Indus River; control over the allocation of irrigation waters is often exercised by privileged elites, leaving millions of Pakistanis vulnerable to water shortages; and much of the water flowing into the Indus comes from China or from tributaries originating in India, leaving Pakistan in an unfavorable (downstream) position in the system. These conditions have led, in the past, to internal squabbles over water rights and to tensions with India over control of the Indus; now, with the likelihood of diminished meltwater from the Himalayan glaciers, the risk of water scarcity triggering **violent conflict** of one sort or another becomes that **much greater**.22

Pakistan, the Indus, and U.S. Security

There is no doubt that Pakistan is considered by U.S. security analysts as a “state important to U.S. national security interests,” the term used by the Defense Intelligence Agency to describe countries of concern in the 2012 ICA on water. Not only is Pakistan a critical—if not always wholehearted—partner in the global war on terror, but it also possesses a **substantial arsenal** of nuclear weapons whose security is a matter of **enormous concern** to American leaders.23 Should those munitions wind up with rogue elements of the Pakistani military (some of whose members are believed to maintain clandestine links to radical Islamic organizations), or even worse, should Pakistan descend into civil war and the weapons fall into untrustworthy or hostile hands, the safety of India and other US allies—as well as of American forces deployed in the region—would be at **grave risk**.24 Ensuring Pakistan’s stability therefore, has long been a major U.S. security objective, prompting regular deliveries of American arms and other military aid. Yet, despite billions of dollars in American aid, Pakistan remains vulnerable to social and ethnic internal strife.25

As noted, farming is the principal economic activity in Pakistan, and ensuring access to water is an overarching public and **government concern**. This means, above all, **managing the use** of the Indus—the country’s main source of water for irrigation and its **major source** of power for electricity generation. Pakistan’s rising population and growing cities, with their rings of factories, are placing an immense strain on the Indus, leading to competition between farmers, industrialists, and urban consumers. With water and power shortages becoming an increasingly frequent aspect of daily life, public protests—sometimes turning violent—have erupted across the country. In one particularly intense bout of rioting, following a prolonged power outage in June 2012, protestors burned trains, blocked roads, looted shops, and damaged banks and gas stations.26

However bad things might be in Pakistan today, climate change is likely to make conditions far worse in the years ahead. Prolonged droughts, climate scientists believe, will occur with increasing regularity, posing a severe threat to the nation’s agricultural sector and further reducing the supply of hydroelectric power. At the same time, warming is expected to increase the intensity of monsoon downpours, resulting in massive flooding (as occurred in 2010) and the loss of valuable topsoil, further adding to Pakistan’s woes. As the Himalayan glaciers melt, moreover, water flow through the Indus will diminish.27 With the competition for land and water resources bound to increase and with Pakistan already divided along ethnic and religious lines, widespread civil strife will become ever more likely, possibly jeopardizing the survival of the state.

It is impossible to predict exactly how the United States might respond to a systemic breakdown of state governance in Pakistan. One thing is clear, however: At the earliest sign that the country’s nuclear weapons are at risk of falling into the hands of hostile parties, the American military would respond with decisive force. In fact, research conducted by the nonpartisan Nuclear Threat Initiative (NTI) has revealed that the Joint Special Operations Command (JSOC) and specialized Army units have been training for such contingencies for some time and have deployed all the necessary gear to the region. In the event of a coup or crisis, the NTI revealed, “U.S. forces would rush into the country, crossing borders, rappelling down from helicopters, and parachuting out of airplanes, so they can secure known or suspected nuclear-storage sites.” Recognizing that any such actions by American forces could trigger widespread resistance by the Pakistani army and/or various jihadist groups, the U.S. Central Command, which has authority over all American forces in the region, has developed plans for backing up JSOC personnel with full-scale military support.28

Another scenario that has some analysts worried is the possibility that a time of **sharply reduced** water flow through the Indus will coincide with efforts by India to exploit its advantageous position as the upper riparian on three key tributaries of the Indus—the Ravi, the Beas, and the Sutlej—to divert water for its own use, thereby depriving downstream Pakistan of vital supplies and provoking a war between these two countries. India was granted control over the three tributaries under the Indus Water Treaty of 1960, and various Indian leaders have threatened at times to dam the rivers or otherwise reduce their flow into Pakistan as a reprisal for Pakistani attacks on Indian bases in the disputed territory of Kashmir (through which the tributaries flow); this, in turn, has provoked counter-threats from Pakistani leaders.29 What analysts fear most, in such a situation, is that India, possessing **superior conventional forces**, would overpower Pakistan’s equivalent armies, leading Pakistan’s leaders to order the use of nuclear weapons against India, igniting a regional nuclear war. Such a conflict, scientists have calculated, would result in 50 to 125 million fatalities, and produce a **dust cloud** covering much of the Earth, decimating **global agriculture**—an outcome with enormous implications for American national security.30

#### b] Sino-India Conflict – goes Nuclear

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China, India, and the Brahmaputra River

The potential for interstate conflict—even nuclear conflict—over shared water supplies arises in the case of another **major river** at risk from climate change: The Brahmaputra, which originates in China and traverses much of northeastern India before merging with the Ganges in Bangladesh and emptying into the Bay of Bengal. The fifth-largest river in the world by volume of water flow, the Brahmaputra starts on the northern slopes of the Himalayas and flows easterly across the southern Tibetan plateau (where it is known as the Yarlung Tsangpo) before making a nearly 180-degree turn and crossing into the Indian state of Arunachal Pradesh; from there, it flows in a southwesterly direction towards its confluence with the Ganges and thence its exit into the Bay of Bengal. For the Chinese, the Brahmaputra is an **important engine** of hydroelectric power; they have already installed one dam on the river, at Zangmu, and have announced plans for at least three more. For the Indians, it is a **valuable source** of irrigation water, especially in agriculture-dependent regions of the northeast. Leaders of both countries are **fully aware** of their counterparts’ interests and concerns over the river but have made little effort to reach a mutual understanding—let alone any formal agreements—regarding its future development.31

Several factors make the future status of the Brahmaputra a matter of **deep concern** to security analysts. To begin with, the river enters India through the state of Arunachal Pradesh, an area of northeastern India abutting Tibet that is claimed by both countries. Beijing insists that this region was once part of the kingdom of Tibet, and so belongs to China; New Delhi claims it is a legitimate part of India under a 1914 treaty between Tibet and Great Britain. The two sides fought a war here in 1962, with India suffering significant battlefield setbacks but China agreeing to restore the status quo ante. The countries have not been able to resolve the ownership dispute in subsequent years, despite intermittent negotiations, and both continue to maintain substantial military forces in the region. To this day, discord over Arunachal Pradesh remains a **continuing source** of friction in Sino-Indian relations and a **potential spark** for violent conflict.32

Another potential source of friction between China and India arises from Chinese plans (or rumors of such plans) to divert water from the upper Brahmaputra and funnel it via a series of tunnels and canals to northeastern China, where existing supplies are hugely inadequate.33 While dismissed by many Chinese experts as overly ambitious and costly, the notion of diverting water from the Brahmaputra has generated considerable anxiety in India, where experts fear that the resulting decline in water flow into the Indian section of the river would threaten agricultural productivity. Given the centrality of farming in the Indian economy and political system, any Chinese move to proceed with such a diversion project could lead to increased tension between the two countries. 34

Few analysts believe that a Sino-Indian conflict over the Brahmaputra is likely in the years immediately ahead. Both countries have strong motives for maintaining friendly—if not necessarily, warm—relations between them, and water issues have not yet dominated the bilateral agenda. This, however, is where global warming enters the picture. The Brahmaputra, like the Indus, draws much of its flow during dry seasons from the melting of Himalayan glaciers—and these, as has already been noted, are melting as a result of climate change, and could **eventually disappear**. For both China and India, the melting of the Himalayan glaciers will have **momentous consequences**. Given the Brahmaputra’s **critical importance** to agriculture and economic activity in both countries, any significant long-term decline in its flow would be **highly disruptive**, causing widespread hardship and social unrest.35

Under these **more stressful conditions**, the Chinese leadership, desperate to provide additional supply to China’s water-starved northeast, might be more inclined to proceed with water diversion projects on the Brahmaputra and other shared river systems.36 Coming at a time of equivalent water scarcity in India, such an effort is almost certain to trigger a **harsh Indian response**. “The most salient climate-related point of conflict [between China and India] could be China’s move to divert the upstream waters of rivers originating in the Himalayan watershed,” the NIC warned in a special report on climate change and India. “If China was determined to move forward with such a scheme, it could become a **major element** in pushing China and India towards an adversarial rather than simply a competitive relationship. Border clashes related to control of the rivers are not out of the question.”37

Any conflict between China and India over the waters of the Brahmaputra, should one occur, is most likely to remain a localized affair, without provoking a full-scale mobilization of forces on both sides. During the 1962 war over Arunachal Pradesh, Chinese army troops engaged their Indian counterparts in disputed areas along the border, but neither side escalated to large-scale combat. However, once fighting breaks out, it is impossible to predict the **succeeding chain** of events, and any outcome is conceivable. A minor skirmish along the Indo-Chinese border might not be a cause for alarm in the United States, but a larger war between those two countries undoubtedly would be. Both are armed with nuclear weapons, and Washington views India as a strategic counterweight to China.38 A crushing defeat of India would be viewed as a **potential threat** to American national interests and might conceivably precipitate U.S. **military intervention**. Where that might lead is anyone’s guess, but the mere possibility of such combat has made this scenario a matter of deep concern for security analysts in Washington.39

#### Nuke war causes extinction AND outweighs other existential risks

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**PND 16**. internally citing Zbigniew Brzezinski, Council of Foreign Relations and former national security adviser to President Carter, Toon and Robock’s 2012 study on nuclear winter in the Bulletin of Atomic Scientists, Gareth Evans’ International Commission on Nuclear Non-proliferation and Disarmament Report, Congressional EMP studies, studies on nuclear winter by Seth Baum of the Global Catastrophic Risk Institute and Martin Hellman of Stanford University, and U.S. and Russian former Defense Secretaries and former heads of nuclear missile forces, brief submitted to the United Nations General Assembly, Open-Ended Working Group on nuclear risks. A/AC.286/NGO/13. 05-03-2016.<http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/OEWG/2016/Documents/NGO13.pdf> //Re-cut by Elmer

Consequences human survival 12. Even if the 'other' side does NOT launch in response the smoke from 'their' burning cities (incinerated by 'us') will still make 'our' country (and the rest of the world) **uninhabitable**, potentially inducing global famine lasting up to **decades**. **Toon and Robock** note in ‘Self Assured Destruction’, in the Bulletin of Atomic Scientists 68/5, 2012, that: 13. “A nuclear war between Russia and the United States, even after the arsenal reductions planned under New START, could produce a nuclear winter. Hence, an attack by either side could be suicidal, resulting in **self assured destruction**. Even a 'small' nuclear war between India and Pakistan, with each country detonating 50 Hiroshima-size atom bombs--only about 0.03 percent of the global nuclear arsenal's explosive power--as air bursts in urban areas, could produce so much smoke that temperatures would fall below those of the Little Ice Age of the fourteenth to nineteenth centuries, shortening the growing season around the world and threatening the global food supply. Furthermore, there would be massive ozone depletion, allowing more **ultraviolet** radiation to reach Earth's surface. **Recent studies** predict that agricultural production in parts of the **U**nited **S**tates and **China** would decline by about **20 percent** for four years, and by 10 percent for a decade.” 14. A conflagration involving USA/NATO forces and those of Russian federation would most likely cause the deaths of most/nearly all/**all humans** (and severely impact/extinguish **other species**) as well as destroying the delicate interwoven techno-structure on which latter-day 'civilization' has come to depend. Temperatures would drop to below those of the last ice-age for up to 30 years as a result of the lofting of up to 180 million tonnes of very black soot into the stratosphere where it would remain for decades. 15. Though human ingenuity and resilience shouldn't be underestimated, human survival itself is arguably problematic, to put it mildly, under a 2000+ warhead USA/Russian federation scenario. 16. The Joint Statement on Catastrophic Humanitarian Consequences signed October 2013 by 146 governments mentioned 'Human Survival' no less than 5 times. The most recent (December 2014) one gives it a highly prominent place. **Gareth Evans**’ ICNND (International Commission on Nuclear Non-proliferation and Disarmament) Report made it clear that it saw the threat posed by nuclear weapons use as one that at least threatens what we now call 'civilization' and that potentially **threatens human survival with an immediacy that even climate change does not**, though we can see the results of climate change here and now and of course the immediate post-nuclear results for Hiroshima and Nagasaki as well.