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#### The current WTO patent system is locking in global cannabis monopolies.

Kellner 21 “Mitigating the Effects of Intellectual Property Colonialism on Budding Cannabis Markets” Hughie Kellner [Hughie Kellner came from the small farm town of Uvalde, Texas and received a bachelor’s degree in Physics from the University of Texas at Austin. Upon graduation from the Indiana University Maurer School of Law, Hughie will deploy his physics degree while prosecuting patents in the Frankfurt am Main, Germany office of Leydig, Voit, & Mayer. After Hughie’s first year at Maurer, he worked for a law firm in Thailand as a Stewart Fellow.] Indiana Journal of Global Legal Studies Vol. 28 #1 (Winter 2021) <https://www.repository.law.indiana.edu/ijgls/vol28/iss1/9/> SM

B. How the Patent Has Become a Tool for Globalization

The trade-offs have been deemed beneficial by most of the international community, judging by the WTO’s TRIPS Agreement, whereby any signatory must institute a patent system to their national order.57 This requirement was seen to advance the benefits that intellectual property brings to markets and provide assurance for companies who depend upon intellectual property (for our purposes, patents) that they will be protected.58 Thus, investment and commercial activity can now more easily flow into countries where before the lack of protection rendered prospective costs of business prohibitive.59

The TRIPS Agreement imposed strong, uniform requirements upon signatory countries that went a long way towards its goal of globalization, and unlike most international treaties, required enforcement mechanisms with teeth.60 The most relevant requirement here is that the member patent office examining the patent may not discriminate “as to the place of invention, the field of technology and whether products are imported or locally produced.”61 This requirement allows great freedom to engage in business within member countries, and prevents a patent office from giving any advantage to its own citizens that it would not give to a foreigner, unless allowed under other treaties.62 Further, if a patent is secured in the relevant country, a business does not need to set up a subsidiary within that country to obtain protection.63

To assist actors whose businesses cross international borders, the PCT was enacted by the World Intellectual Property Organization (WIPO) to reduce barriers when seeking protection for inventions.64 The PCT, while a treaty in name, acts more like an organization; as the WIPO describes the PCT:

The Patent Cooperation Treaty (PCT) assists applicants in seeking patent protection internationally for their inventions, helps patent Offices with their patent granting decisions, and facilitates public access to a wealth of technical information relating to those inventions. By filing one international patent application under the PCT, applicants can simultaneously seek protection for an invention in a very large number of countries.65

Importantly, filing an application to the PCT does not grant a patent international reach; the inventor must file a patent application and await approval in each jurisdiction they wish to pursue, and patents are still enforceable only in the countries where they are obtained.66 Rather, filing your invention to the PCT, and denoting the countries where you seek patent protection, means that the PCT will provide information on the timeframe and likelihood of a patent being granted in that jurisdiction, along with certain assistance that varies based on the jurisdiction sought.67

C. How Companies Can Utilize Patents Internationally

Both the TRIPS Agreement and the PCT reduce barriers to transferring business across national boundaries by easing the transference of the intellectual property needed. The PCT acts merely as a helping hand and information collection tool, while the TRIPS Agreement acts to ensure that intellectual property will operate largely the same from jurisdiction to jurisdiction and, importantly, will be protected with uniform minimum standards. Without commenting on the desirability of this uniform treatment throughout varying economies, it has never been easier for businesses to use their intellectual property to enter international markets.68 In fact, under the TRIPS Agreement and PCT, companies can file a patent in a country where they have no connections,69 acquire a patent, and simply license the technology to (or bring infringement suits against) companies in the member country without needing to ever establish a presence.70

Notably, the PCT and many countries’ patent systems require you to file your patent application within a restricted timeframe after it is first disclosed.71 Thus, this transportation of patent rights must be loosely simultaneous throughout jurisdictions. However, the fact still remains that sophisticated actors who utilize the protections of the TRIPS Agreement can now acquire a monopoly to practice an invention in any country that is a signatory to the TRIPS Agreement or PCT. This usually reaches far short of global domination since companies generally file only in jurisdictions where they expect the benefit of using the patent to outweigh the cost of applying for one.72 However, if the inventor files a patent in every country that has a viable market for that invention, especially if only a few markets exist, the inventor could create an economic climate close to a global monopoly.

#### Thailand proves – the world is trending towards legalization but big pharma patents lock in cannabis monopolies and crowd out local growth.

Kellner 21 “Mitigating the Effects of Intellectual Property Colonialism on Budding Cannabis Markets” Hughie Kellner [Hughie Kellner came from the small farm town of Uvalde, Texas and received a bachelor’s degree in Physics from the University of Texas at Austin. Upon graduation from the Indiana University Maurer School of Law, Hughie will deploy his physics degree while prosecuting patents in the Frankfurt am Main, Germany office of Leydig, Voit, & Mayer. After Hughie’s first year at Maurer, he worked for a law firm in Thailand as a Stewart Fellow.] Indiana Journal of Global Legal Studies Vol. 28 #1 (Winter 2021) <https://www.repository.law.indiana.edu/ijgls/vol28/iss1/9/> SM

The reason the Thai public was so concerned over the cannabis patents filed by Otsuka and GW is that they represented the floor falling out from beneath them. The patents claimed both cannabinoid oil itself and a process for extracting the cannabinoid oil from the cannabis plant, which, based on the way they sought protection, was very likely not patentable anyway.88 However, if either Otsuka or GW received a patent, that patent would be an incredibly powerful tool in clearing competition in the upcoming market. Members of the Thai public saw their newly granted cannabis industry about to be swallowed up and taken from them by a foreign pharmaceutical company before they even had a chance to venture into it themselves.

This more than questionable “emergency order,” which temporarily blocked the possible grant of patents to Otsuka or GW, paid lip service to the allowances under the TRIPS Agreement,89 but in reality discriminated based on the applicant’s nationality. The goal of the order was to avoid a scenario of foreign monopolization that could pop up in any market that is a signatory to the TRIPS Agreement and institutes some form of commercialization of cannabis. GW and Otsuka Pharmaceuticals did not do anything illegal; they had the right to apply for protection of their intellectual property and did so. The Thai government acted on legally questionable grounds,90 but had a just reason to do so: attempting to avoid the exportation of an upstart cannabis market that would provide a lucrative cash crop to a highly agrarian Thai population.91

The scenario of recreational cannabis markets being promptly secured by foreign interests grows more and more likely as cannabis companies grow larger and more countries look to liberalize cannabis laws.92 As of right now, Canada’s recreational cannabis market, the only recreational cannabis market open to privatization,93 supports the largest cannabis companies in the world with vast amounts of capital, competition, and the best incentives to research and develop products better than and before their competitors.94

The logic of the feared scenario is as follows: if there exists a jurisdiction that establishes a market that produces entities who innovate more than any other jurisdiction, then that jurisdiction will be state of the art by definition. When another jurisdiction opens up a market, until that market supports entities who are innovating on their own and at a level that surpasses or escapes the prior jurisdiction, all entities will either operate below state of the art or at the same level as the prior, more advanced jurisdiction. With that innovation comes the possibility for patent protection. As discussed in Part II, a patent is only enforceable in the jurisdiction (usually country) it is acquired in. However, with the binding rules of the WTO TRIPS Agreement and the helping hand of the PCT, a patent in one country can easily become a patent in another country. If a patent is acquired by the most innovative entities and exported to the less innovative jurisdiction, entities in the less innovative jurisdiction must pay to use that patent if they wish to operate at the state of the art or, alternatively, stop their business. Therefore, the monopoly of one jurisdiction can be imposed upon another jurisdiction, suppressing actors in the less advanced jurisdiction simply because the first jurisdiction got a head start.95 This fear was present at the time the TRIPS Agreement was signed and is still present today:

[S]ome analysts interpret the growing concern of industrialized nations with intellectual property rights as an attempt to control the diffusion of new technologies . . . to freeze the existing international division of labor by way of the control of technology transfers . . . . [I]t is important to recognize that for a [lesser developed] country a reform designed to increase intellectual property rights protection will tend to generate a welfare loss at its initial stages. Because [lesser developed countries] are typically net importers of technology, a usual consequence of a more strict regime of intellectual property laws would be an increase in royalty payments to foreigners.96

As this plays out in today’s evolving cannabis industry, if someone is going to make advancements in the cannabis industry, most of those advancements will be from the Canadian actors before Thai actors, due to the head start and the stronger expected return on innovation in the Canadian recreational market. The Canadian actors’ innovations would be merely the product of the regulatory policies of their respective jurisdiction being amenable to innovation, and then importing those innovations into a jurisdiction that had not previously been amenable to innovation. Accordingly, the Canadian Patent Office has seen the effects of the innovative incentives: the Canadian market has produced and processed many patent applications.97

Further, even if Thailand prohibited any foreign actor from producing, importing, exporting, selling, or engaging with the Thai cannabis industry in any meaningful way, a foreign company could still force itself into the industry with the patent rights and structures available to it under the TRIPS Agreement.98 Without ever having a physical presence, business can be generated by filing a patent and forcing others to license the use of the patent or face an infringement lawsuit.99 Even if an action is not infringing, a patent could be used to threaten a lawsuit upon a new business 100 (every business in the Thai market will be new) that likely would not possess the resources to defend a patent lawsuit (one of the most expensive types of lawsuits)101 and would be forced to submit to a licensing arrangement or close its doors.102

This is so only because Canada decided to violate the terms of the UN Single Convention.103 Thus, Canada was able to safely internalize every first-mover benefit available because the other 184 countries party to the Single Convention, and all other G7 countries, would still be prevented from establishing a recreational cannabis market. Canada may not have had any malicious motives; after all, it did ensure that its regulatory scheme governed international trade as mandated by the Single Convention,104 and thus attempted to keep any acts that violate that treaty from causing other nations to violate it. This seems like the intention of a good neighbor who knows they have broken the rules, but the best intentions in the world do not alone alter the operation or availability of other global legal structures.

A solution needs to be found whereby local actors, who did not have a chance to innovate, are given an opportunity to establish themselves so they can innovate while foreign business and investment is also allowed to participate in the market, bringing their advantage of experience rather than legal monopoly. In the following section, I argue that a solution, unique to the cannabis market, can be found by imposing a small and circumscribed amendment to the TRIPS Agreement, as a resolution to the Canadian recusal from the UN Single Convention.

#### Big pharma leverages cannabis patents to block out competition and secure monopoly – decks medical marijuana access

Barnett 20 Hailey A. Barnett [J.D. candidate 2020, Tulane University Law School; B.A. 2017, Communication, cum laude, Texas A&M University.], "High Risk, High Reward: Patent Law's Effects on the Medical Marijuana Industry," Tulane Journal of Technology and Intellectual Property 22 (2020): 125-164 <https://heinonline.org/HOL/LandingPage?handle=hein.journals/tuljtip22&div=8&id=&page=> SM

B. Cannabis Patents and Pharmaceutical Companies

Patent protection is a key component of the United States legal system. On principle, we should compensate and reward those who have rightfully invented something, as well as incentivize and stimulate further innovation. The marijuana industry has been historically composed of people who believe in the cause, the plant, and the health benefits it brings. Yet, many of the field's "new players" are getting involved with a specific 89 business purpose in mind. Cannabis patents are one way to normalize and bring the industry to the mainstream, but the winners in the patent system are often those who are first and have the most money.'90

It's no secret why everyone wants a piece of the marijuana industry pie: according to an April 2018 report by Grand View Research, Inc., the global legal marijuana market is projected to be worth $146.4 billion by 025.'9' The report additionally found that in 2016, medical marijuana emerged as the largest segment of the industry and is estimated to be valued at $100.03 billion by 2025.192

One way to obtain a monetary stake in the medical marijuana market is to use the patent process to acquire ownership over a particular strain and its seeds.' 93 This limited monopoly ensures that the patent holder "is the only one who can make or sell the product, or license other people to do so."'94 However, there are so many unanswered questions that surround IP protection of a federally illegal substance, it is unclear if the patents will be upheld.'9 5 If cannabis patents are upheld in federal courts, it is possible that a handful of companies could be in a position to demand licensing fees from the rest of the industry.1 96

This incentive is particularly appealing to major multinational pharmaceutical companies (Big Pharma) and is already being capitalized on today. For example, pharmaceutical firms are already seven of the top ten cannabis patent holders in Canada.' 97 These patents, filed prior to the country's full legalization of marijuana, would have been difficult to enforce prior to legalization.' 9 8 However, after Canada legalized marijuana on October 17, 2018, the patents became fully enforceable and gave the companies a key strategic advantage over non-patent holders in the ever- increasingly competitive market.' 99 The biggest concern is that Big Pharma companies will harness their powerful lobbies and seemingly bottomless payrolls to engage in patent blitzes. In other words, they will try to enlarge their patent portfolios and subsequent ownership of marijuana strains and their ancillary byproducts, such as oils, to marginalize competitors.

In the United States, the FDA plays a crucial role in approving and 201 regulating medications for public use. Big Pharma requires the FDA's approval to bring their products to the public market, and it's no secret that Big Pharma's influence on the agency has accrued over many decades and billions of dollars spent.2 0 2 The current FDA Commissioner Scott Gottlieb recently slammed Big Pharma and accused drugmakers of using "gaming tactics" to stall the introduction of generic versions of biologic drugs, "a move that cost the U.S. healthcare system billions of dollars last year. "203 One of these tactics is to engage in patent blitzes, or evergreening, right before a drug's patent protection (and subsequent market exclusivity 20 4 period) expires. "In the pharmaceutical trade, when brand-name companies patent 'new inventions' that are really just slight modifications of old drugs, it's called 'evergreening. "'205 Evergreening occurs because once a drugmaker's patent on a particular drug expires, the door is open for other producers to bring generic versions of the drug to market.206 Patents in patent blitzes are often granted for even the most trivial improvements and innovations related to existing drugs.207 The purpose of evergreening is two-fold: first, to extend the commercial dominance of brand-name drugs, and second, to tie up producers of the generic drugs in 2 08 costly, time-consuming litigation. Evergreening prevents a generic drug's market entry and further extends Big Pharma's monopolies.2 09

A prime example of recent evergreening is when Mylan hiked the price of its life-saving epinephrine injectable drug, EpiPen, by more than 400%.210 After Teva Pharmaceuticals gained approval from the FDA for the first generic version of EpiPen, Mylan sued them for patent infringement, although epinephrine alone was already a generic drug.2 1 Mylan settled and kept "Teva off the EpiPen market until 2015."212 Much like AbbVie's battle with AmGen over a generic version of the former's costly biologic drug Humira, Big Pharma's inclination to place company profits over the needs and desires of patients could continue with cannabis strain patents. 2 13 This will ultimately affect cost and access to medical marijuana products.

Thanks to shifting public opinion and state legalization, a growing number of cannabis patent applications have been filed with the USPTO and it is very likely they will be granted. Although marijuana remains illegal at the federal level, the premature filings signal hope that sometime in the near future, the federal government will reconsider its stance on cannabis, and make medical and recreational marijuana use legal from sea to shining sea.215

Companies with a large numb1er of cannabis strain patents, such as BioTech, could become an even bigger national player in the field of cannabis strain patents as they acquire more market share. Overall, if Big Pharma obtains exclusive rights to use, produce, and sell particular cannabis strains, together with their large influence over the FDA and other government regulatory bodies, they can control public access and maintain already robust profit margins.217

Not surprisingly, Big Pharma is not the only industry chasing profits from marijuana IP rights. Smaller breeders, including scientists who alter the plant for medicinal purposes, worry that large bioagricultural companies like Monsanto and Syngenta will hoard cannabis-based patents and deploy their massive economic power to position themselves as another dominant force in the market.218 in short, an open and accessible marketplace for cannabis products, especially for medicinal use, depends on tracking the patent activity of wealthy, powerful entities to ensure smaller entities are not marginalized.219

#### Monopolies kill cannabis biodiversity which throttles medical marijuana advances and industry innovation.

Barnett 20 Hailey A. Barnett [J.D. candidate 2020, Tulane University Law School; B.A. 2017, Communication, cum laude, Texas A&M University.], "High Risk, High Reward: Patent Law's Effects on the Medical Marijuana Industry," Tulane Journal of Technology and Intellectual Property 22 (2020): 125-164 <https://heinonline.org/HOL/LandingPage?handle=hein.journals/tuljtip22&div=8&id=&page=> SM

A. Biodiversity Implications for Cannabis Strain Patents

Biodiversity, or biological diversity, is an ongoing controversy in the marijuana patent industry. Like comprehensive research on the benefits and drawbacks of medical marijuana, "empirical analysis on biodiversity in the patent system is limited."2 2 2 Biodiversity is a broad term but is generally defined as "biological diversity in an environment as indicated by numbers of different species of plants and animals." 23 Increasingly, however, countries and companies are asserting IP rights in native flora, 224 impacting global biodiversity.

"Historical documents from around the world, some dating as far back as 2900 B.C., tell us that cannabis has lived alongside humans for thousands of years, cultivated for food, fiber, and fodder, as well as for religious and medicinal purposes." 2 5 The fear is that without a wide variety of cannabis strains available for breeding and growing, production and processing of the plant will inevitably consolidate into the hands of large conglomerates.22 6

The United States and Thailand are signatories to the Convention on Biological Diversity (Biodiversity Convention), a multilateral treaty committed to sustainable development. The Biodiversity Convention's goals include "conserving biological diversity, promoting the sustainable use of its components, and the fair use and equitable sharing of benefits from biological resources."228 The Biodiversity Convention requires signatories to enforce regulations on plant patent applications and mandates that new patent applications include the plant's genetic resources and evidence of local use if they seek to patent the plant in a certain country. This is the chief reason behind the Biodiversity Sustainable Agriculture Food Sovereignty Action Thailand's (Biothai) call for careful scrutiny of recently filed foreign cannabis patents in the country, as discussed in greater detail in the next Section.

Since medical marijuana is now legal for use and manufacture in Thailand, the mere implication that fabled Thai marijuana strains, such as "Northern Lights," could be available on the global market has generated 23 much buzz. 1 Like Cuban cigars or French champagne, Thai marijuana is known for its potency and quality.232 Thailand's marijuana is apure sativa landrace strain, meaning it is a local strain of cannabis that has adapted to Thailand's native environment and conditions over time. Environment plays a key role in the THC, CBD, and terpene quality and quantity and is part of what makes landrace strains so unique. For example, the marijuana plants and seeds that are indigenous to the tropical jungles of Thailand are bred to preserve their naturally occurring high THC levels.235

As more cannabis strain patents are granted worldwide, it is possible that growers will be increasingly dependent on seed makers that hold patents on certain types of seeds and methods used to produce them. As a result, growers will be subject to agreements and royalties and will be charged licensing fees for use of the seeds. A healthy number and variety 236 of available cultivars are vital for advancing cannabis legalization and the industry’s continued growth. From an agricultural perspective, the patent system encourages a consolidation and reduction of variety in order to enhance and maximize profits. This can be seen in today's staple crops, such as com, soy, and wheat, where fewer cultivars exist than they did decades ago.23 9 Other crops globally consumed today, such as fruits 240 and vegetables, are likely grown from patented varieties or cultivars. As a result, agricultural biodiversity has diminished due to the introduction and consolidation of genetically modified, patented varieties, and it is highly likely the cannabis industry could see a similar fate.24 1

Cannabis biodiversity will be threatened if there are fewer available cultivars and, thus, fewer strain options.2 42 Fewer available strains could also lead to limited consumer experiences and patient treatment options. This notion, coupled with already limited clinical and scientific research, could significantly throttle advances in medical marijuana availability and use.2 43 The corporatization of the industry, thanks to patent law, could see smaller growers and businesses merging into giant conglomerates, with 2 the profits being held in the hands of a very few. 4 In short, the "winners" of the cannabis patent wars will dominate the industry post-prohibition.2 45

Some argue that expanding strain patents could have the opposite effect and allow researchers and physicians to "correctly identifty], dos[e], and perhaps even personalize prescriptions for particular strains in the future" to treat specific ailments.24 6 Patents are a hallmark of innovation, and with wide access to more and better cannabis strains, there could be innovation advances in the industry as a whole.2 47 However, the reality is that cannabis patents are likely to be held by large corporations, given what we have seen before with the United States government and the FDA's involvement.24 8

Both medical marijuana patients and recreational marijuana users are strain-driven. While the current cannabis landscape is rich with hundreds of different varieties, strain patents could lead to a "locked genetic landscape where innovation becomes rare and costly."2 4 9 Further, a monopoly on the local strains of one country could have disastrous effects on that country's biodiversity and its rights to that biodiversity.2 50

#### Monopolies kill market growth and disincentivize innovation.

Gunelius 20 “How Big Business, Monopolies and Stacked Licenses Impact the Marijuana Industry,” February 7, 2020, Originally published 3/4/17, Susan Gunelius is President & CEO of KeySplash Creative, Inc. <https://www.cannabiz.media/blog/how-big-business-monopolies-and-stacked-licenses-impact-the-marijuana-industry> SM

However, the continued growth and development of big businesses with deep pockets in the cannabis industry has many people worried that the result of continued mergers and acquisitions will be monopolies, lower quality products, and a shift of revenues away from mom and pop businesses in local communities to out-of-state (or out of country) corporations.

The Start of Monopolies and Oligopolies in the Cannabis Industry

Monopolies and oligopolies are already developing in the cannabis industry — not just in terms of big businesses usurping smaller businesses but also in terms of state regulations that allow vertical integration, which leads to markets dominated by one or a few players that control the cultivation, processing, and sale of cannabis products.

To clarify, all but two states (Louisiana and Washington) with active medical or recreational cannabis programs allow or require vertical integration of the cannabis supply chain. Cannabiz Media defines the related cannabis license structures as follows:

Fully stacked licenses: A single licensed business can or is required to handle all operations from seed to sale in a fully vertically integrated structure.

Partially stacked licenses: A single licensed business can or is required to handle more than one operation but not all operations from seed to sale.

Unstacked licenses: Different businesses handle different operations across the supply chain from seed to sale.

For example, in Minnesota, the state’s medical marijuana program requires full vertical integration with only one type of license – the Medical Cannabis Manufacturer license. Currently, only two of these licenses are allowed in the state to grow, process, and sell (at four dispensaries each) cannabis.

Other states, like Colorado and Oregon, have ceased to award additional licenses to some cannabis businesses in the past thereby creating oligopolies. In California, oligopolies are forming in a different way. Regulations passed leading up to opening the state’s adult-use market in 2018 allowed large businesses to exploit a loophole and obtain as many cultivator licenses as they could afford.

Across the country, smaller cannabis businesses are struggling to compete with other bigger cannabis companies. In Maryland, large out-of-state companies (including several well-known cannabis companies that are publicly traded on the Canadian Securities Exchange) have been quietly taking control of multiple marijuana dispensaries through management agreements or acquisition plans that circumvent the state’s regulations limiting ownership to one dispensary.

The concern about monopolies and oligopolies in the cannabis industry was in the Florida news extensively throughout 2019 when a Florida court ruled that the state’s required vertical integration was unconstitutional.

The Future of Marijuana and Big Business

Bottom line, whenever every business that wants to be in an industry cannot enter the market, competition will not flourish. The result is the same whether businesses are shut out due to state regulations or because big businesses have deeper pockets and force smaller players to leave. Either way, the result is the same. Fewer players equals less competition which usually leads to higher prices and limited market growth.

As Sean Williams of The Motley Fool warned back in 2017, “The culprit for the substantial drop in marijuana prices appears to be big businesses infiltrating the industry and flooding the market with product. As with any industry, if big business can push the little guy out, they’ll have considerably more liberties down the road to raise their prices back up and capture a juicier margin, along with greater market share.”

Only free competition ensures fair prices and market growth over the long-term as well as ongoing innovation and product accessibility.

#### Shifting away from corporate cannabis monocultures is key to organic weed.

Russo 19 “MARIJUANA NOT MONOCULTURE!” Sarah Russo [writer, cannabis consultant, and a social media and content manager. She got her degree in environmental studies and social justice, with a focus in plant medicine from the Evergreen State College], May 2, 2016 updated April 2, 2019, <https://www.projectcbd.org/es/node/494> SM

We have a pesky, non-organic thorn in our side. Our current agricultural system is not based on sustainable means of cultivation and, unfortunately, this also applies to much of cannabis farming today. While the “organic” marijuana movement is gaining momentum, the vast majority of cultivators grow cannabis as a monocultural crop, which often entails the use of toxic pesticides and plant growth boosters to maximize profit.

A monoculture, or “monocropping,” involves growing one type of crop to the exclusion of others. There are virtually zero examples of monocropping in nature. Unlike monocropping, sustainable growing practices mimic what is done in nature and seek to recreate it in a controlled setting.

As interest in medical cannabis has increased, the terms “organic” and “sustainably grown” have become trendy buzzwords within the industry. There is obviously a need to propagate more cannabis to supply a large consumer demand, but the “more for your money” approach to growing has not been conducive to healthy stewardship of the land. Our corporate-dominated agricultural system is broken, and the cannabis industry should not emulate its worst features.

Some cannabis farmers have adopted sustainable, alternative practices, including a technique known as companion planting or “multicropping.” Companion planting is a method of cultivation where various plants are grown together in ways that promote a dynamic, flourishing ecosystem. Companion planting improves the land’s resilience and also increases the yield and health of the plants within the garden.

The science of intercropping cannabis is still in its infancy. Presently, there is little scientific study of companion planting in general, and research and development efforts in the area of cannabis cultivation face additional obstacles due to the plant’s historical stigma. But the absence of hard science doesn’t discredit the ancient cultivation methods that utilized permaculture techniques as the standard. Human beings were growing sustainably long before the advent of toxic, soil-depleting industrial agriculture.

“Companion planting is a method of cultivation where various plants are grown together in ways that promote a dynamic, flourishing ecosystem.”

A classic example of companion planting is the “Three Sisters Method” used by indigenous peoples in the Americas for food production. Various tribes planted beans, corn, and squash—the golden crop trio—in proximity. This practice reflects an understanding of plant mutualism, wherein each cultivar has one or more functions that benefit the botanicals growing around it. In the Three Sisters model, the beans act as a nitrogen-fixer, which is essential for plant growth; the corn feeds off the nitrogen; the beans use the corn to climb on; the squash provides a source of shade and natural mulch, which conserves moisture in the soil and aids the growth of beans and corn. The plants are engaged synergistically in positive ways, and this contributes to a dynamic, thriving agricultural environment.

The ancient practice of companion planting has been resurrected by modern-day permaculture farmers and to a lesser extent by cannabis growers. According to permaculturist Kate Miller of Alpine Botanicals in Nederland, Colorado, companion planting is “even more important now that we see what’s happening to the planet, to soil fertility or lack thereof, and to our pollinating insects. Pollinators such as honey bees, butterflies, bats, and other insects simply do not thrive in a monoculture.”

Miller’s medicinal garden includes cannabis and various companion plants with therapeutic properties of their own. Sometimes, these botanical companions can be combined with cannabis to create artisanal herbal formulas for healing.

MULTIPLE BENEFITS

Miller says that comfrey offers significant benefits as a botanical companion, functioning simultaneously as a cover crop and dynamic accumulator. Comfrey is also a natural remedy for external wounds, rashes, repairing tissue, and other skin issues. “The only downside of growing comfrey,” Miller explains, “is that it can take over and its large leaves can also shade out other plants. This is not a bad thing if you’re trying to prevent weeds. You can chop up the comfrey leaves and use it as living mulch throughout the season, or even as animal fodder.”

Alfalfa is another example of a companion plant with therapeutic as well as other benefits. Alfalfa acts as a nitrogen-fixer and it also stabilizes terraces to prevent soil erosion. A cultivator can harvest alfalfa for making compost. Or it can be brewed and consumed as a mineral-rich medicinal tea.

Image

Cameron, another Colorado-based cannabis cultivator, maintains that intercropping techniques enable his plants to reach their greatest potential. “As far as ganja farmers are concerned,” he asserts, “a high diversity of organic soil offers all the nutrients for the plant to bloom into its fullest expression. This enhances both the flavor profile and resin content.”

A well-fed plant is more likely to be disease-resistant. Permaculture techniques can build a plant’s resilience, making it stronger and healthier. Some cannabis cultivators utilize mycorrhizal fungus as a soil topping at the base of a marijuana plant to increase nutrient availability. “When all ecological niches are intentionally filled with beneficial organisms, there is little space for pests to take hold,” says Cameron.

Cannabis is a highly adaptable and durable plant, but diseases and pests pose ongoing risks in both indoor and outdoor cultivation. Monocultures are major targets for problematic insects and pathogens like powdery mildew. By diversifying their crop spectrum, farmers are less likely to lose plants to disease and insect infestation. Companion planting also helps to create a stable, diverse habitat for a myriad of birds, bees, and small animals, which interact in positive ways with their botanical counterparts.

OUTDOORS AND INDOORS

For outdoor grows, crop rotation can help an ecosystem flourish by diversifying the earthly terrain. It’s more difficult but not impossible to implement companion planting techniques when growing indoors. This can be accomplished by placing various companion plants—like basil to deter pests—around cannabis pots. Cover crops with shallow roots can also be placed at the base of a marijuana plant to promote nutrient availability in the soil. You can also get creative by planting aromatic herbs for cooking and for medicinal purposes when growing indoors.

“Throughout modern U.S. history, we have seen farmers falling victim to the monoculture cash crop mentality,” says Casey O’Neill, owner of Happyday Farms in Northern California. He grows 47 different kinds of veggies amongst his outdoor cannabis varieties. This enables Happyday to maximize space and harvest as much as possible from the same garden. O’Neill says that companion planting lowers cultivation costs and mitigates risk by providing economic protection that is lacking in monoculture farming. In the event of a theft or a raid, his food crops are left untouched and he is still able to sell vegetables at the local farmer’s market.

#### Organic weed key to climate change – removes CO2 from the atmosphere and reverses harms of corporate farming.

Bronner 8/23 “Opinion: Cannabis industry needs regenerative organic farming, not modified seeds,” August 23, 2021, David Bronner [Cosmic Engagement Officer (CEO) of Dr. Bronner's, BA Biology from Harvard] <https://hempindustrydaily.com/opinion-cannabis-industry-needs-regenerative-organic-farming-not-modified-seeds/> SM

As the legal cannabis industry continues to expand, it’s urgent that we understand the consequences of placing too much reliance on large industrial cannabis grown indoors under artificial lighting.

Now is the imperative time to acknowledge natural farming as one of the solutions for mitigating the impacts of climate change.

We should be looking for ways to be kinder to the Earth and to reject harmful chemical-intensive agricultural practices. We should embrace organic farming methods that improve soil health and build resilient, regenerative supply chains that nurture both people and planet.

I’m disturbed by reports that seed breeders are using gene-editing technology to develop varieties that no longer contain THC but have the addition of herbicide-resistant genes so growers can spray weed killer on their plants.

Two years ago, I founded the cannabis brand Brother David’s, the first cannabis brand to become Sun+Earth Certified — the regenerative organic certification for cannabis that guarantees the cannabis is grown under the sun, organically in soil, and that farmers and farmworkers are fairly paid.

Brother David’s, and our ally Sun+Earth, along with other advocates and experts in the industry share a common mission to move the cannabis industry away from chemical-intensive farming practices.

Because official organic certification from the U.S. Department of Agriculture remains off-limits to high-THC cannabis producers, Sun+Earth provides validation for cannabis consumers who want to know how their cannabis is produced.

Cannabis is a bio-accumulator that relies on the richness of the soil in which it’s grown and pulls toxins from the soil. But those toxins eventually get passed on to the consumer in the cannabis products they buy.

And the vast majority of cannabis currently sold in the United States has no labeling that explains how it’s grown and whether chemicals used in its production are harmful to people, the soil and the natural environment.

According to the market research group TrendSource and its 2019 Cannabis Industry Report, more than 53% of consumers are willing to pay more for organic cannabis products. In order to bridge the gap between consumer preference and the actual supply of cannabis in the market, Sun+Earth aims to shift the industry toward healthier, more sustainably and ethically-grown cannabis.

Just as genetically modified seeds are not the answer to our agricultural industries, finding ways for cannabis to be more easily sprayed with toxic chemicals is also counterproductive to the cannabis and hemp industry.

Sun+Earth is also committed to reducing the impacts of climate change in an industry that uses excessive amounts of energy to grow plants indoors.

Industrial cannabis production in the U.S. uses the same amount of energy it takes to power 1.7 million U.S. homes. It generates greenhouse gas emissions equivalent to that of 3 million cars, on an annual basis.

According to a report from 2012, indoor cannabis production uses 1% of all electricity consumed in the US at a cost of $6 billion per year.

More recently, the 2021 report from Colorado State University found that indoor cultivation in the U.S. produces up to 5,184 kilograms of greenhouse gas emissions for each kilogram of harvested flower.

Regenerative organic cultivation standards encourage the planting of cannabis alongside food crops with strategic use of cover crops, composting, mulching, and reduced soil tillage — methods that have been shown to sequester carbon from the atmosphere and are championed as a part of the solution to global warming by groups like the Rodale Institute, a pioneer of organic agriculture research and consumer education.

The regenerative organic model for cannabis grown under the sun, in the soil, without chemical fertilizers or toxic pesticides can drastically reduce the carbon footprint of cannabis, and indeed build networks of food and flower production that are themselves more resilient to the impacts of climate change.

Sun+Earth stands as an ideal model and a beacon of hope for the cannabis industry and the broader agricultural sector. This innovative certification relies not on new genetic technology, but on farming methods that work with the natural world instead of suppressing it.

Such tried and true methods have been used for millennia and represent more of an answer to producing cleaner cannabis and for building healthy, vital soil that can better address our current environmental and agricultural crises.

#### Warming causes extinction

**Pester 21** (Patrick, staff writer for Live Science. His background is in wildlife conservation and he has worked with endangered species around the world. Patrick holds a master's degree in international journalism from Cardiff University in the U.K. and is currently finishing a second master's degree in biodiversity, evolution and conservation in action at Middlesex University London. Citing **Luke Kemp, a research associate at the Centre for the Study of Existential Risk at the University of Cambridg**e in the United Kingdom AND **Michael Mann, PhD, distinguished professor of atmospheric science at Penn State**. “Could climate change make humans go extinct?” [https://www.livescience.com/climate-change-humans-extinct.html August 30](https://www.livescience.com/climate-change-humans-extinct.html%20August%2030), 2021)DR 21

According to Mann, a global temperature increase of 5.4 degrees Fahrenheit (3 degrees Celsius) or more could lead to a collapse of our societal infrastructure and massive unrest and conflict, which, in turn, could lead to a future that resembles some Hollywood dystopian films.

One way climate change could trigger a societal collapse is by creating food insecurity. Warming the planet has a range of negative impacts on food production, including increasing the water deficit and thereby reducing food harvests, [Live Science previously reported](https://www.livescience.com/58891-why-2-degrees-celsius-increase-matters.html). Food production losses can increase human deaths and drive economic loss and socio-political instability, among other factors, that may trigger a breakdown of our institutions and increase the risk of a societal collapse, according to a study published Feb. 21 in the journal [Climatic Change](https://go.redirectingat.com/?id=92X1590019&xcust=livescience_us_1191050396230939400&xs=1&url=https%3A%2F%2Flink.springer.com%2Farticle%2F10.1007%2Fs10584-021-02957-w&sref=https%3A%2F%2Fwww.livescience.com%2Fclimate-change-humans-extinct.html).

Related: [Has the Earth ever been this hot before?](https://www.livescience.com/65927-has-earth-been-this-hot-before.html)

Past extinctions and collapses

Kemp studies previous civilization collapses and the risk of climate change. Extinctions and catastrophes almost always involve multiple factors, he said, but he thinks if humans were to go extinct, climate change would likely be the main culprit.

"If I'm to say, what do I think is the biggest contributor to the potential for human extinction going towards the future? Then climate change, no doubt," Kemp told Live Science.

All of the major [mass-extinction events](https://www.livescience.com/mass-extinction-events-that-shaped-Earth.html) in Earth's history have involved some kind of climatic change, according to Kemp. These events include cooling during the Ordovician-[Silurian](https://www.livescience.com/43514-silurian-period.html) extinction about 440 million years ago that wiped out 85% of species, and warming during the [Triassic](https://www.livescience.com/43295-triassic-period.html)-[Jurassic](https://www.livescience.com/28739-jurassic-period.html) extinction about 200 million years ago that killed 80% of species, Live Science previously reported. And more recently, climate change affected the fate of early human relatives.

While [Homo sapiens](https://www.livescience.com/homo-sapiens.html) are obviously not extinct, "we do have a track record of other hominid species going extinct, such as [Neanderthals](https://www.livescience.com/28036-neanderthals-facts-about-our-extinct-human-relatives.html)," Kemp said. "And in each of these cases, it appears that again, climatic change plays some kind of role."

Scientists don't know why Neanderthals went extinct about 40,000 years ago, but climatic fluctuations seem to have broken their population up into smaller, fragmented groups, and severe changes in temperature affected the plants and animals they relied on for food, according to the [Natural History Museum](https://www.nhm.ac.uk/discover/who-were-the-neanderthals.html) in London. Food loss, driven by climate change, may have also led to a tiny drop in Neanderthal fertility rates, contributing to their extinction, [Live Science previously reported](https://www.livescience.com/65594-neanderthal-fertility-led-to-extinction.html).

Climate change has also played a role in the collapse of past human civilizations. A [300-year-long drought](https://www.livescience.com/38893-drought-caused-ancient-mediterranean-collapse.html), for example, contributed to the downfall of ancient Greece about 3,200 years ago. But Neanderthals disappearing and civilizations collapsing do not equal human extinction. After all, humans have survived climate fluctuations in the past and currently live all over the world despite the rise and fall of numerous civilizations.

Homo sapiens have proven themselves to be highly adaptable and able to cope with many different climates, be they hot, cold, dry or wet. We can use resources from many different plants and animals and share those resources, along with information, to help us survive in a changing world, according to the [Smithsonian’s National Museum of Natural History](https://humanorigins.si.edu/research/climate-and-human-evolution/climate-effects-human-evolution).

Related: [How would just 2 degrees of warming change the planet?](https://www.livescience.com/58891-why-2-degrees-celsius-increase-matters.html)

Today, we live in a global, interconnected civilization, but there's reason to believe our species could survive its collapse. A study published on July 21 in the journal [Sustainability](https://www.mdpi.com/2071-1050/13/15/8161/htm) identified countries most likely to survive a global societal collapse and maintain their complex way of life. Five island countries, including New Zealand and Ireland, were chosen as they could remain habitable through agriculture, thanks to their relatively cool temperatures, low weather variability and other factors that make them more resilient to climate change.

New Zealand would be expected to hold up the best with other favorable conditions, including a low population, large amounts of good quality agricultural land and reliable, domestic energy. So, even if climate change triggers a global civilization collapse, humans will likely be able to keep going, at least in some areas.

Turning on ourselves

The last scenario to consider is climate-driven conflict. Kemp explained that in the future, a scarcity of resources that diminish because of **climate change could** potentially create conditions for wars that threaten humanity. "There's reasons to be concerned that as water resources dry up and scarcity becomes worse, and the general conditions of living today become much, much worse, then suddenly, the threat of potential nuclear war becomes much higher," Kemp said.

Put another way, climate change impacts might not directly cause humans to go extinct, but it could lead to events that seriously endanger hundreds of millions, if not billions, of lives. A 2019 study published in the journal [Science Advances](https://advances.sciencemag.org/content/5/10/eaay5478) found that a nuclear conflict between just India and Pakistan, with a small fraction of the world's nuclear weapons, could kill 50 million to 125 million people in those two countries alone. Nuclear war would also change the climate, such as through temperature drops as burning cities fill the atmosphere with smoke, threatening food production worldwide and potentially causing mass starvation.

What's next?

While avoiding complete extinction doesn't sound like much of a climate change silver lining, there is reason for hope. Experts say it isn't too late to avoid the worst-case scenarios with significant cuts to greenhouse gas emissions.

"It is up to us," Mann said. "If we fail to reduce carbon emissions substantially in the decade ahead, we are likely committed to a worsening of already dangerous extreme weather events, inundation of coastlines around the world due to melting ice and rising sea level, more pressure on limited resources as a growing global population competes for less food, water and space due to climate change impacts. If we act boldly now, we can avoid the worst impacts."

#### Only growth of legalized cannabis markets decks illegal imports and cartel revenues

Bier 18 David J. (David J. Bier is a research fellow with a focus on immigration at the Cato Institute. He is an expert on legal immigration, border security, and interior enforcement.\_, 12-19-2018, "How Legalizing Marijuana Is Securing the Border: The Border Wall, Drug Smuggling, and Lessons for Immigration Policy," Cato Institute, <https://www.cato.org/policy-analysis/how-legalizing-marijuana-securing-border-border-wall-drug-smuggling-lessons> mvp

Legalized markets directly affect the illegal markets for marijuana. Not only is it easier to obtain domestically produced cannabis today, legal marijuana is also more uniform and of much higher quality than the illegal Mexican product.[14](https://www.cato.org/policy-analysis/how-legalizing-marijuana-securing-border-border-wall-drug-smuggling-lessons#endnote-014) One study for the Colorado Department of Revenue found that a “comparison of inventory tracking data and consumption estimates signals that Colorado’s preexisting illicit marijuana market for residents and visitors has been fully absorbed into the regulated market.”[15](https://www.cato.org/policy-analysis/how-legalizing-marijuana-securing-border-border-wall-drug-smuggling-lessons#endnote-015) Marijuana legally grown in states where it is legalized often supplies consumers in states where marijuana is still outlawed. In 2014, 44 percent of marijuana sales in Denver were to residents of other states.[16](https://www.cato.org/policy-analysis/how-legalizing-marijuana-securing-border-border-wall-drug-smuggling-lessons#endnote-016) The Colorado study found that “legal in‐​state purchases that are consumed out of state” are likely occurring.[17](https://www.cato.org/policy-analysis/how-legalizing-marijuana-securing-border-border-wall-drug-smuggling-lessons#endnote-017) This places further downward pressure on prices and has prompted lawsuits by prohibitionist states against Colorado.[18](https://www.cato.org/policy-analysis/how-legalizing-marijuana-securing-border-border-wall-drug-smuggling-lessons#endnote-018)

A prelegalization study estimated that after legalization, it would likely be more expensive to smuggle marijuana from Mexico to every state in the continental United States except Texas than to have it sent from Colorado and Washington.[19](https://www.cato.org/policy-analysis/how-legalizing-marijuana-securing-border-border-wall-drug-smuggling-lessons#endnote-019) This competition appears to be affecting Mexican marijuana prices. Mexican growers have reported that marijuana prices in Mexico have recently fallen between 50 and 70 percent after U.S. legalizations.[20](https://www.cato.org/policy-analysis/how-legalizing-marijuana-securing-border-border-wall-drug-smuggling-lessons#endnote-020) According to the DEA, overall domestic American production has grown because of the new state‐​approved marijuana markets.[21](https://www.cato.org/policy-analysis/how-legalizing-marijuana-securing-border-border-wall-drug-smuggling-lessons#endnote-021) Customs and Border Protection (CBP) itself has hypothesized that one explanation for the decline could be that “legalization in the United States [h]as reduced demand” for Mexican marijuana.[22](https://www.cato.org/policy-analysis/how-legalizing-marijuana-securing-border-border-wall-drug-smuggling-lessons#endnote-022) The fact that some cartels have taken to using drug tunnels to smuggle migrants — who are less profitable and more readily identifiable — is further evidence of the effects of legalization.[23](https://www.cato.org/policy-analysis/how-legalizing-marijuana-securing-border-border-wall-drug-smuggling-lessons#endnote-023)

Efforts to Combat Drug Smuggling

Drug interdiction has a long history in the United States, dating back to alcohol prohibition. During the 1920s, the interdiction of bootleggers served as a principal justification for the creation of the Border Patrol. Labeling them “unscrupulous” and their traffic “nefarious,” government reports repeatedly called on Congress for more agents, money, and aircraft to interdict alcohol.24 From 1926 to 1934, agents intercepted nearly 2 million quarts of liquor.25 Nonetheless, only the end of Prohibition brought about the collapse of the bootleg trade, which dropped 90 percent from 1930 to 1934 and finally disappeared entirely in 1935.

After alcohol prohibition, smuggling of other prohibited drugs has taken over as justification for increasing Border Patrol spending. Since 1951, the Border Patrol’s annual reports have highlighted its contributions to the “drive against narcotics,” particularly its seizures of Mexican marijuana.26 While Mexico has also prohibited the cultivation of the plant since the 1920s, the relative lack of enforcement, the good growing climate, and the differences in economic development between that country and the United States have led Mexico to become the main supplier for its northern neighbor.27 But in 1937, Congress effectively banned the sale of marijuana.28

Today, the Department of Homeland Security (DHS) has the primary responsibility for interdicting drug traffickers entering the United States. DHS divides its efforts between four agencies: the Coast Guard, which patrols the coasts of the United States; the Office of Field Operations (OFO), which inspects travelers entering legally through ports of entry; Border Patrol, which surveils the northern and southern borders; and Air and Marine Operations (AMO), which supports Border Patrol’s efforts between ports of entry with aircraft and marine vessels. OFO, Border Patrol, and AMO are all divisions of Customs and Border Protection (CBP). Together, these four agencies dedicate $4.2 billion annually specifically to drug interdiction.29

Since 1965, Congress has invested $64 billion to secure the border from illegal immigration as well as drug smuggling.30 Some 82 percent of the spending has occurred in the last two decades alone. Border Patrol has a force of nearly 20,000 agents, a fivefold increase over the level in 1992.31 AMO has an expansive fleet of 286 vessels, 246 aircraft, and 9 unmanned aerial drones designed to spot and interdict traffickers.32 Since 2000, Border Patrol has constructed nearly 600 miles of border fencing and barriers.33

In addition, CBP has nearly 1,500 canine teams used to detect drugs.34 The agency has deployed an extensive system of surveillance equipment between ports of entry, including drones and towers, and adopted new scanners and other technology at ports of entry.35 Despite these purchases, the DHS inspector general concluded in 2016 that the department “could not ensure its drug interdiction efforts met required national drug control outcomes nor accurately assess the impact of the approximately $4.2 billion it spends annually on drug control activities.”36 Similarly, none of its spending had any noticeable effect on the amount of drug smuggling prior to the legalization of marijuana in several states in 2014.

The White House has proposed several additional measures to deter drug smuggling along the border. These measures include a southwestern border wall with Mexico, which carries an estimated price tag of at least $22 billion to construct.37 In addition, the administration has requested that Congress fund the hiring of an additional 5,000 Border Patrol agents to patrol the southwest border.38 President Trump and the White House have repeatedly connected these efforts to build a border wall with drug smuggling, in particular, the smuggling of opioids like fentanyl and heroin.39

Measuring Drug Flows

Because illicit marijuana moves in the black market, no consistent and reliable data exist on the quantities that smugglers bring into the United States each year. The best available proxy for estimating changes in the flow is the amount that the government seizes at the border. This measure does not provide a reliable predictor of the absolute amount being smuggled, but it can capture trends in the flow. Although the total amount that makes it into the country is likely many times greater than the amount that the government seizes, a relationship will exist between seizures and inflows that allows an approximation of the trends up or down in total flows. In the absence of any other changes that significantly improve or hamper the effectiveness of smuggling or enforcement, more drug smuggling will generally result in greater seizures.

The main possibility that could make seizures a poor proxy for relative flows between years is if the effectiveness of enforcement or smuggling is wildly inconsistent, resulting in a wide variance in the amounts of drugs that agents discover. For example, if most drugs seized at the border came from only a few seizures, or most drugs smuggled came from only a few attempts, the amounts could fluctuate so widely that they would be worthless in assessing changes in the level of smuggling over time.

But because the marijuana seized crossing the border is spread out over many seizures — more than 12,000 annually — chance is less of a factor in these overall trends.40 Moreover, as seen in Figure 2 in the following section, the amount each agent seized was quite consistent before 2014 at an average of 115 pounds per year. Prior to legalization, the average year‐​over‐​year change from 2003 to 2013 was almost zero, compared to 25 percent declines from 2014 to 2018 — greater than one standard deviation downward from the prelegalization trend each year.41 Other data stretching back to the early 1990s support the conclusion that each agent has consistently seized a similar amount.42 Variation in the effectiveness of enforcement or smuggling cannot explain the sudden and persistent decline in seizures over the last five years.

Another issue is that increased enforcement would likely lead to more seizures. It is possible, however, to control for the level of enforcement by focusing on the quantity seized per agent, rather than the aggregate amount for the entire agency (Figure 2). One difficulty with the per‐​agent measurement is that the effectiveness of agents could decrease with each new hire, so the result could measure just the declining utility of the marginal hire rather than a real decline in smuggling. When the agency doubled its labor force from 2003 to 2011, however, the rate of seizures per agent remained flat, while the agency slightly reduced the number of agents during the period of declining seizures from 2014 to 2018. These facts suggest that the decline in seizures per agent is not an effect of diminishing returns from increasing the size of the force.43

In the immigration context, researchers often use the number of apprehensions of border crossers per agent to estimate year‐​to‐​year trends in total inflows of illegal crossers of the southwest border.44 The validity of this measure has recently received support from a 2017 DHS report that used survey data to estimate the number of total successful crossings for the 17‐​year period from 2000 to 2016.45 Comparing these estimates to the per‐​agent apprehension figures during this time indicates that 86 percent of the variance in successful entries can be predicted by the number of apprehensions per agent, making apprehensions a very strong predictor of the year‐​to‐​year trends in successful illegal crossings. Given the similarities between illegal entry of people and the illegal entry of drugs, the same is likely true for drug seizures and smuggling.

Seizures also fail to capture policy changes that could direct agents to prioritize or deprioritize marijuana smuggling, though it is not clear how Border Patrol could, as a technical matter, target a specific illicit drug without also seizing other drugs in the process. In any case, formal policy on marijuana smuggling has not changed during the relevant period, and there has been no apparent change in informal policy priorities. Moreover, the decline in marijuana seizures has occurred across multiple agencies and administrations. These factors make informal policy priorities an unlikely explanation for the trends.

Less Marijuana Smuggling

State‐​level marijuana legalization has undercut demand for illegal Mexican marijuana, which in turn has decreased the amount of drug smuggling into the United States across the southwest border. Because it is so much more difficult to conceal than other drugs, marijuana prior to legalization was, according to the DEA, “predominately smuggled between, instead of through, the ports of entry.”46 For this reason, the most important agency for marijuana interdiction is the Border Patrol, which patrols the areas between ports of entry.

Figure 2 reports the number of pounds of marijuana seized annually per Border Patrol agent and compares these figures to the total length of the border fences in a year. From FY 2003 to FY 2009, Border Patrol doubled its workforce and constructed hundreds of miles of fences, yet this increased enforcement did not reduce marijuana smuggling.47 Each agent annually seized virtually the same quantity of marijuana through 2013, indicating roughly the same overall inflow of the illegal substance.48 From 2013 to 2018, however, the amount of marijuana each Border Patrol agent seized declined by 78 percent.

Even within FY 2018, the first three months of the fiscal year — before California legalized sales in January — were 29 percent above the next eight months.49 Marijuana smuggling has also not shifted toward entering through ports of entry. The total quantity of marijuana seized by the OFO, the agency that handles admissions at ports of entry, has dropped by 34 percent from 2013 to 2018 (Table 1).50 Seizures have decreased over water and airborne smuggling routes. While numbers for FY 2018 are not available yet, Air and Marine Operations interdicted 42 percent fewer pounds of marijuana in 2017 than in 2013.51 Likewise, the Coast Guard has seen a 65 percent decline in marijuana seizures during that period.52 Overall, all DHS agencies seized 56 percent less marijuana in 2017 than 2013.

Full legalization of marijuana in several states dramatically increased the amount of marijuana sales that occur legally in the United States. A relatively small amount of legal marijuana sales had occurred prior to 2014 under the auspices of legal medicinal use, and in 2013 and 2014, four states — Massachusetts, New Hampshire, Illinois, and Maryland — legalized medical marijuana. But these states account for just 4 percent of medical marijuana users nationwide, so it is unlikely that they changed the trends substantially.53 Full legalization increased the amount of legal sales from about $1.5 billion to $9.7 billion from 2013 to 2017.54 This increase coincided with a 66 percent drop in the street value of all DHS marijuana seizures — a decline from $2.3 billion in 2013 to $765 million in 2017 (Figure 3).55

The street values of a pound of marijuana estimated by CBP also highlight the increased availability of domestic marijuana. From 2012 to 2017, the average street value of a pound of marijuana seized by CBP declined by 40 percent, dropping from $794 per pound in 2012 to just $474 per pound in 2017.56 Legal marijuana is competing with the drug cartels and lowering prices, which undercuts the financial incentive to smuggle across the border.

Other Drug Smuggling

Mexican drug cartels have responded to their declining share of the marijuana market by smuggling other drugs through ports of entry but have failed to make up for the decline in marijuana smuggling. Most drugs other than marijuana are smuggled through ports of entry because traffickers can more easily conceal them. For this reason, Figure 4 presents seizures both between and at ports of entry.57 In FY 2013, marijuana accounted for 98 percent of all border and customs drug seizures — both between and at ports of entry — by weight. By FY 2018, that percentage had declined to 84 percent.58 While non‐​marijuana drug seizures have increased — indicating that cartels may attempt to compensate by switching drug type — the decline in marijuana seizures has resulted in a 68 percent overall decline in pounds seized per agent of all drugs since FY 2013.

Marijuana may still dominate by weight, but other drugs — methamphetamine (meth), heroin, cocaine, and fentanyl — are much more valuable per pound. Estimating the value of drug seizures is difficult because drug prices vary widely throughout the United States and no government agency consistently estimates a national average. Moreover, CBP does not report the purity of the drugs it seizes, making it impossible to use outside estimates to value its seizures. However, while the agency does not report the collective value of all the drugs it seizes, it does regularly issue press releases that value individual seizures based on “the latest DEA statistics.”59 Aggregating this information provides the best estimate of how the agency values drug seizures.60

CBP reports the “street value” of a drug.61 Street prices inflate the absolute values of drug seizures because drugs obtain those values only after crossing the U.S. border and arriving at their destinations.62 However, the relative values between the different drugs and between different years are still useful for the purpose of comparison.63 The tables in the Appendix contain the valuations, seizure amounts, and number of agents and officers at ports of entry and between ports of entry.

Figure 5 presents the street value of drug seizures made by both Border Patrol agents between ports of entry and by CBP officers at ports of entry, again showing the average amount seized per agent. By value, marijuana has fallen from about 57 percent of seizures to just 18 percent from FY 2013 to FY 2018. The absolute value of marijuana seizures at and between ports of entry has declined 79 percent from $1.8 billion in FY 2013 to be on pace for just $380 million in FY 2018. Overall, the total value of all drug seizures per agent (or officer) has declined by 34 percent from FY 2013 to FY 2018. Marijuana legalization appears to have cut overall drug smuggling.

All the decline in the value of drug seizures occurred between ports of entry. The value of all drug seizures between ports of entry fell by 70 percent on a per‐​agent basis from FY 2013 to FY 2018, while those at ports of entry increased by just 3 percent (Figure 6). In 2018, the drugs seized by OFO officers at ports of entry were three times more valuable than those seized by Border Patrol between ports of entry, while Border Patrol agents seized more valuable drugs in 2013. In 2018, the average inspector at a port of entry seized drugs valued at almost $71,000 compared to about $23,000 for Border Patrol agents between ports of entry. This fact significantly undermines the argument for more Border Patrol agents or a wall to interdict drug smuggling between ports of entry.

#### Cartels are driven by cash flows from illegal drug markets – tackling demand-side is key

Munoz 14 [Andres E, Seattle University School of Law] “Blunt the Violence: How Legal Marijuana Regulation in the United States Can Help End the Cartel Violence in Mexico,” Seattle Journal for Social Justice, Vol 13, Iss 2, Article 18, 2014, <https://digitalcommons.law.seattleu.edu/cgi/viewcontent.cgi?article=1758&context=sjsj> TG

1. Demand for Illegal Drugs in the United States Fuels Cartels

The driving force of cartel power is the demand for drugs in the United States. People in the United States spend approximately $65 billion a year on illegal drugs, and drug-related damages amount to about $110 billion per year.40 A report by the US Senate Caucus on International Narcotics Control published in 2012 stated that about 22.6 million people in the United States over the age of 12 were illegal drug users, accounting for almost nine percent of the population and representing the largest proportion in the past decade.41 Of all illegal drugs used in the United States, marijuana places first, representing over 60 percent of all illegal drug use with 17.4 million users in 2010, followed by 7 million psychotherapeutic users, 1.5 million cocaine users, 1.2 million hallucinogen users, 0.7 million inhalant users, and 0.2 million heroin users.42 Thus this article focuses on how current and up-and-coming laws that legalize recreational marijuana can be tailored to drive the cartels out of business.

The Senate Caucus also found that “[m]ost Americans are unaware of the impact that illegal drug consumption has in fomenting violence in drug trafficking countries in Latin America[,]” citing Mexico as an example.43 During her term as Secretary of State, Hillary Clinton stated that in the United States, “[o]ur insatiable demand for illegal drugs fuels the drug trade.”44 She also stated, “We know very well that the drug traffickers are motivated by the demand for illegal drugs in the United States and that they are armed by the transport of weapons from the United States.”45 Clinton’s comments appear to be the first comments made by a public official of her capacity that admitted that the United States is largely responsible for the violence in Mexico. It is clear from the abovementioned statistics and the statements made by Hillary Clinton that the enormous demand for illegal drugs in the United States fuels Mexican drug cartels. Although most legal, academic, and media sources differ as to how the drug problem in the United States should be solved, it appears that most sources agree that it is a problem that needs to be resolved, not just by tackling the drug abuse problem in the United States, but also by ending the demand for drugs that provide the cartels with a means to exist.

#### Cartel revenue streams determine their viability – cash inflows enable them to buy off local police and cause Mexican state failure

Grinberg 19 [Alexander Grinberg is an officer in the U.S. Army, B.A. in Defense Policy and Strategy] “Is Mexico a Failing State?” RealClearDefense, Feb 7, 2019, <https://www.realcleardefense.com/articles/2019/02/07/is_mexico_a_failing_state_114170.html> TG

Mexico is a fragile state, and without action, faces the risk of becoming a failing, or worse, a failed state. The Organisation for Economic Cooperation and Development [defines](https://www.eda.admin.ch/deza/en/home/themes-sdc/fragile-contexts-and-prevention/fragile-states.html) a fragile state as one that is “unable or unwilling to perform the functions necessary for poverty reduction, the promotion of development, protection of the population and the observance of human rights.” In 2009, U.S. Joint Forces Command released a [statement](https://www.nytimes.com/2009/01/09/world/americas/09iht-letter.1.19217792.html) expressing concerns over Mexico, highlighting the potential even then for a total collapse. At the time, then-President Felipe Calderón [responded](https://www.telegraph.co.uk/news/worldnews/centralamericaandthecaribbean/mexico/4841701/Felipe-Caldern-denies-Mexico-is-a-failed-state.html) to the report, stating it was entirely false; [allegedly](https://newrepublic.com/article/85337/mexico-calderon-clinton-obama-drug-cartels), he even wanted President Obama to release a statement to that effect.

In August 2018, the State Department [released](https://travel.state.gov/content/travel/en/international-travel/International-Travel-Country-Information-Pages/Mexico.html) a do-not-travel warning for five of the thirty-two Mexican states. Many other states are still considered dangerous, and the U.S. State Department has advised American tourists caution if not total reconsideration. The warning indicates a lack of stability and control on the government’s part in the region. The Mexican government is in a prolonged state of civil war with various cartels, and the state is losing. Rampant corruption from the local to federal level breaks down the fundamental principal-agent relationship between the government and its population, encouraging locals to turn to militias for protection. The militias are, in part, a result of widespread corruption as well as the Mexican military’s deterioration. Mexico’s military faces large numbers of desertions, while measures to provide security for its population continue to fail. The United States should continue to treat Mexico as a welcome economic partner but accept that Mexico is a fragile state, and thus a serious security risk.

The drug war in Mexico is escalating, and it is creating a spillover effect in the United States. In the United States, the majority of the concern from the Mexican drug war focuses on its impact on the opioid epidemic, a growing topic in both countries. According to the U.S. Centers for Disease Control, the [total economic burden](https://www.drugabuse.gov/drugs-abuse/opioids/opioid-overdose-crisis) for opioid misuse, often leading to heroin abuse, is $78.5 billion a year. CNN [reported](https://www.cnn.com/2017/09/08/health/heroin-deaths-samhsa-report/index.html) that from 2002 to 2016 the number of heroin users increased from 404,000 to 948,000, a 135% increase. The opioid epidemic is part of the [drug war](https://archives.fbi.gov/archives/news/testimony/drug-trafficking-violence-in-mexico-implications-for-the-united-states) in Mexico, where violence spills over. Demand in the United States for narcotics profit drug trafficking organizations and money is then laundered back to the cartels who use these funds to [purchase weapons](https://www.gao.gov/products/GAO-16-223) in order to take more territory or assert control in Mexico.

The spillover effect is hurting both the United States and Mexico. Assistant Secretary Brownfield, representing the State Department’s Bureau of International Narcotics and Law Enforcement Affairs, noted in a 2017 [teleconference](https://www.state.gov/j/inl/rls/rm/2017/268146.htm) that an estimate of 90-94% of all “heroin consumed in the U.S. comes from Mexico.” While 90% of cocaine samples seized in the U.S. in [2015](https://defenseoversight.wola.org/primarydocs/170302_incsr.pdf) originated from Columbia, the cartels smuggle them through Mexico to the U.S. While drugs flow into the U.S. from Mexico, illegal arms are trafficked back into Mexico, fueling the violence. A [2009 report](https://www.gao.gov/new.items/d09709.pdf) from the U.S. Government Accountability Office noted that approximately 87% of firearms seized in Mexico over the past five years could be traced back to the United States. [Stratfor](https://worldview.stratfor.com/article/mexicos-gun-supply-and-90-percent-myth) disputes this claim, arguing the number of weapons in the figure were those submitted by Mexican authorities to the ATF and successfully traced. The figure did not include the total number of weapons seized. Even if Stratfor’s claim is true and the actual percentage is less than 12%, it is still a concerning number, indicating American arms and associated illegal arms trafficking contribute to the violence and corruption in Mexico.

Corruption in Mexico affects public services and industry, negatively impacting the economic well-being of its citizens. A 2016 World Economic Forum Global Competitiveness Report noted bribery and corruption could increase business costs in Mexico by 10%. Even tax administration is affected, and a 2014 Reuter’s [report](https://www.reuters.com/article/us-mexico-tax-idUSBREA0M1SR20140123?feedType=RSS&feedName=GCA-Economy2010) states that Mexico has one of the weakest tax revenues in the 34-nation Organization for Economic Co-operation and Development. According to the report, “Crime, corruption and tax evasion drained $462 billion from Mexico’s economy in 2011, trailing only China and Russia.” Corrupted tax revenue creates a cyclical effect where the government cannot afford to pay for necessary services or even its military. Corruption increases the cost for basic necessities and thus further incentivizing farmers and other vulnerable populations to support the narco-economy.

Kleptocracy creates an environment that economically incentivizes farmers to support illegal economies and allows these farmers to fall victim to the cartels. A [December 2018 New York Times article](https://www.nytimes.com/2018/12/28/nyregion/el-chapo-trial-mexico-corruption.html) covering the trial of Joaquín "El Chapo" Guzmán’s trial discussed various testimonies in the courtroom that highlighted Mexican corruption at very high levels of office. Mr. Guzman’s testimony supported other [reports](https://www.theguardian.com/world/2016/jun/02/mexico-elections-governors-veracruz-javier-duarte) of widespread corruption throughout Mexico’s government at [both](https://www.theguardian.com/world/2018/sep/27/javier-duarte-mexico-veracruz-guilty-sentenced-corruption) state and federal levels. Rural farmers fall victim to cartels, because the Mexican government cannot protect them. Stuart Ramsay, a correspondent for Sky News, traveled to Mexico to [report](https://www.youtube.com/watch?v=lWUgsoRiCrA) on Mexico’s continuing drug war. Many of the interviewed farmers admitted that economic incentives to support a narco-economy, in conjunction with death threats, overruled legal crop farming. Krishnan Guru-Murthy, a British journalist for Channel 4 News, traveled to Cancun to [discuss](https://www.youtube.com/watch?v=Rz6t2FEablA) the current state of Mexico’s drug war. Part of his report showcased the cartel’s ability to murder with near impunity farmers who resisted. The inability of the police to combat this form of terror explains why farmers tend not to resist. Farmers who do resist, typically through an ad hoc militia, add further chaos into an already unstable situation.

Max Weber theorized on the state’s monopoly on legitimate violence as a fundamental tenet of the modern state, and militias challenge this legitimacy—they degrade the state’s ability to maintain order, and they disrupt the basis of a social contract between the state and its society. These militias are a symbol in that they challenge the state as the sole entity with the monopoly on the legitimate use of force. The rise of militias and Mexico’s inability to make gains in securing territory against the cartels suggest the Mexican government is no longer in control over parts of its country. One might consider the growth of local militias within Mexico’s rural areas as a way forward, but they are dangerous and indicate the Mexican government cannot defend its citizens. Mexican militias operate outside of the law, and many create their own rules on how to protect their towns. While some militias work with their communities and achieve some level of peace, others act with more questionable methods. In a 2016 Al Jazeera report, journalists recorded militias who patrolled towns and even stopped Mexican police at gunpoint. The police did not resist as they were ordered to present documentation, weapon serial numbers, and a reason for movement. The power dynamic changed. Along with the militias, the Mexican government is struggling to sustain its armed forces.

One of the reasons Mexico cannot gain ground over the cartels is because its military is deteriorating through ineffective leadership. The first indicator of the military’s breakdown is the deterioration of discipline where there is a growing number of unlawful killings and human rights violations. Human Rights Watch reported that by 2016, the National Human Rights Commission received almost 10,000 complaints, and more than a 100 cases were considered as “serious human rights violations.” Of those abuses investigated from 2012 to 2016, only 3.2% reached a conviction. Instead of cracking down on these abuses, President Nieto expanded military participation in policing. As the drug war continues, and the federal government does not crack down on the human rights violations, the Mexican military will further deteriorate. The Mexican military leadership’s lack of control over the behavior of their forces indicates an erosion in the chain of command and the respect for their Code of Military Justice, and it suggests further corruption.

Mexican cartels provide financial incentives for members of Mexico’s armed forces to defect, a symptom of the Mexican military's weak state. A 2008 USA Today article noted that from January to September 2007 4,956 soldiers deserted, approximately 2.5% of the force. Fox News reported that by 2012 over 56,000 soldiers deserted. As of 2016, the total approximate number of deserters is around 150,000. PBS interviewed local reporters in Cancun and a former police officer, learning the cartels would offer payments of $26,000 compared to the soldier’s $600 salary. Also, these underpaid officers were poorly trained and equipped, some to a point where an officer carried only six rounds of ammunition. The article also reported the cartels were waging a propaganda war against the military. They posted ads and offered better pay than the army. The cartels successfully recruit from the military, specifically even finding recruits from Mexican special forces communities. Many of these deserters end up working for the cartels as trained hitmen who comprehend Mexican military tactics. These trained ex-soldiers understand how to circumvent Mexican patrols, and have a basic understanding of how to effectively engage conventional military forces.

The gradual comprehensive collapse of order in Mexico is unlikely to reverse even with the recent election of Andrés Manuel López Obrador. Obrador’s counter-cartel policy platform of amnesty, as well as his aspirations for a military reformation, will only embolden the cartels. However, as he just took office, it is important to wait and see what he and his cabinet will pursue and the effectiveness of their policies.

#### Mexican DTO instability spills over into Latin American instability

Soumaya 20 [Paula Soumaya, 2-7-2020, "The Role of Global Governance in Curtailing Mexican Cartel Violence," E-International Relations, https://www.e-ir.info/2020/02/07/the-role-of-global-governance-in-curtailing-mexican-cartel-violence/ || belle]

* DTOs = drug trafficking organizations

The reach of Mexican cartels’ dealings has expanded as the world has become more globalized. Globalization and digitalization have facilitated international communication which is imperative to the international trafficking of drugs. Mexican cartels notoriously transport drugs to the United States through their shared border. According to the 2018 National Drug Threat Assessment, Mexico is the primary source of heroin, methamphetamine, fentanyl, and other synthetic opioids in the United States (U.S. Department of Justice and Drug Enforcement Administration 2018, pp.vi). To facilitate the movement of product, cartels maintain a domestic presence within countries of destination. DTOs, such as the Sinaloa Cartel, have a pervasive reach in the USA which can bring cartel related violence into foreign countries. Competition for drug routes into the United States has expanded cartel violence into foreign land. Border cities between Mexico and the United States, such as Tijuana and Ciudad Juarez, constituted the most violent municipalities in Mexico in 2018 due to competition for dominance over smuggling routes (Justice in Mexico 2019: 4, Teixeira 2016:7, 33-35). Violence instigated by cartels expands southward to Central and South America as well. Mexican DTOs use Central American corridors to move South American drugs, further destabilizing the region as their dominance over the continent’s narcotics trade grows (United Nations Office on Drugs and Crime 2007: 44-48, Global Governance and the challenge of transnational organized crime: the role of the constructive Powers, 2012: 5-8, Reveles, Lara Klahr and Spiller, 2013: 149-153) . The reach of Mexican cartels and the violence they instigate raises international peace and security concerns.

#### Latin American instability goes nuclear

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As the previous chapter demonstrates, for the past two hundred years the principal cause of concern for U.S. defense policymakers and planners thinking about Latin America has been the prospect that great powers outside the Western Hemisphere could exploit the military weakness and internal security challenges of the states within it to threaten U.S. security. While there is reason for optimism about the future of Latin America,58 there is also cause for concern. The region faces enduring obstacles to economic59 and political development60 as well as signi􀂿cant internal security challenges. As General John Kelly, the commander of U.S. Southern Command (SOUTHCOM)61 noted in his March 2013 posture statement before Congress, Latin America: 􀀾I􀁀s a region of enormous promise and exciting opportunities, but it is also one of persistent challenges and complex threats. It is a region of relative peace, low likelihood of interstate con􀃀icts, and overall economic growth, yet is also home to corrosive criminal violence, permissive environments for illicit activities, and episodic political and social protests.62 The instability and non-traditional security challenges that General Kelly cites provide potential opportunities for the United States’ major rivals to (borrowing a term from Monroe’s declaration) “interpose” themselves into the region and, by so doing, threaten regional stability and U.S. security. Two discernible trends suggest that current and prospective Eurasian rivals could seek to exploit regional conditions and dynamics in ways that could impose immense costs on the United States and divert its attention from more distant theaters overseas. The first trend is a return to a heightened level of competition among the “great powers” following two decades of U.S. dominance. The second trend concerns the growing cost of projecting power by traditional military means due to the proliferation of “anti-access/area-denial” (A2/AD) capabilities in general, and precision-guided munitions (PGMs) in particular. These trends suggest that, despite a possible decline in relative U.S. power, external forces will continue to 􀂿nd it beyond their means to threaten the hemisphere through traditional forms of power projection. Far more likely is a return of a competition similar to that which the United States engaged in with the Soviet Union during the Cold War. During that period both powers sought to avoid direct con􀃀ict with the other, given the risks of escalation to nuclear con􀃀ict. Instead each focused primarily on gaining an advantage over the other through the employment of client states and non-state groups as proxies. Proxies were employed for reasons other than avoiding a direct clash, such as gaining positional advantage (e.g., enabling the sponsor to establish bases in its country, as the Soviets did in Cuba). Proxies were also employed as a means of diverting a rival’s attention from what was considered the key region of the competition and to impose disproportionate costs on a rival (e.g., Moscow’s support of 􀀱orth Vietnam as a means of drawing o􀌆 U.S. resources from Europe). This chapter outlines trends in the Western Hemisphere security environment that outside powers may seek to exploit to advance their objectives in ways that threaten regional stability and U.S. security. This is followed by a discussion of how these external powers might proceed to do so. Seeds of Instability Crime, Illicit Networks, and Under-Governed Areas Latin America has a long history of banditry, smuggling, and organized crime. As in the case of Pancho Villa and the 1916-1917 Punitive Expedition, these activities have occasionally risen to a level at which they in􀃀uence U.S. national security calculations. Rarely, however, have these activities been as pervasive and destabilizing as they are today. Although a wide variety of illicit activity occurs in Latin America, criminal organizations conducting drug tra􀌇cking are the dominant forces in the Latin American underworld today, accounting for roughly 􀀇􀀗0 billion per year63 of an estimated 􀀇100 billion in annual illicit trade.6􀀗 Since the Colombian cartels were dismantled in the 1990s, this lucrative trade has been dominated by powerful Mexican cartels whose operations extend across the length and breadth of Mexico, as well as up the supply chain into the cocaine-producing regions of the Andean Ridge and through their wholesale and retail drug distribution networks across the United States.65 The cartels, along with countless smaller criminal organizations, comprise what the head of SOUTHCOM has described as, 􀀾a􀁀n interconnected system of arteries that traverse the entire Western Hemisphere, stretching across the Atlantic and Paci􀂿c, through the Caribbean, and up and down 􀀱orth, South, and Central America . . . 􀀾a􀁀 vast system of illicit pathways 􀀾that is used􀁀 to move tons of drugs, thousands of people, and countless weapons into and out of the United States, Europe, and Africa with an e􀌇ciency, payload, and gross pro􀂿t any global transportation company would envy.66 That being said, the drug tra􀌇cking underworld is by no means a monolithic entity or cooperative alliance. Rather, it is a fractious and brutally competitive business in which rival entities are constantly and literally 􀂿ghting to maximize their share of the drug trade and for control of the critical transshipment points, or plazas, through which it 􀃀ows. To attack their competitor’s operations and protect their own operations from rivals and the Mexican government’s crackdown that began in 2006, the cartels have built up larger, better armed, and more ruthless forces of hired gunmen known as sicarios. Using the billions of dollars generated by their illicit activities, they have acquired weapons and equipment formerly reserved for state armies or state-sponsored insurgent groups, including body armor, assault ri􀃀es, machine guns, grenades, landmines, anti-tank rockets, mortars, car bombs, armored vehicles, helicopters, transport planes, and—perhaps most remarkably—long-range submersibles.67 The cartels’ pro􀂿ts have also enabled them to hire former police and military personnel, including members of several countries’ elite special operations units68 and, in several cases, active and former members of the U.S. military.69 These personnel bring with them—and can provide to the cartels—a level of training and tactical pro􀂿ciency that can be equal or superior to those of the government forces they face. As a result of this pro􀂿ciency and the military-grade weapons possessed by the cartels, more than 2,500 Mexican police o􀌇cers and 200 military personnel were killed in confrontations with organized crime forces between 2008 and 2012 along with tens of thousands of civilians.70 In the poorer states of Central America, state security forces operate at an even greater disadvantage.71 While their paramilitary forces enable the cartels to dominate entire cities and large remote areas through force and intimidation, they are not the only tool available. The cartels also leverage their immense wealth to buy the silence or support of police and government o􀌇cials who are often presented with a choice between plata o plomo—“silver or lead.” According to the head of the Mexican Federal Police, around 2010 the cartels were spending an estimated 􀀇100 million each month on bribes to police.72 By buying o􀌆 o􀌇cials—and torturing or killing those who cannot be corrupted—the cartels have greatly undermined the e􀌆ectiveness of national government forces in general and local police in particular. This, in turn, has undermined the con􀂿dence of the population in their government’s willingness and ability to protect them. Through these means and methods the cartels have gained a substantial degree of de facto control over many urban and rural areas across Mexico, including major cities and large swathes of territory along the U.S.-Mexico border. In many of these crime-ridden areas the loss of con􀂿dence in the government and police has prompted the formation of vigilante militias, presenting an additional challenge to government control.73 Meanwhile, in the “northern triangle” of Central America (the area comprising Guatemala, Honduras, and El Salvador through which the cartels transship almost all cocaine bound for Mexico and the United States) the situation is even more dire. Approximately 90 percent of crimes in this area go unpunished, while in Guatemala roughly half the country’s territory is e􀌆ectively under drug tra􀌇ckers’ control.7􀀗 Further south, similar pockets of lawlessness exist in coca-growing areas in Colombia, Venezuela, Ecuador, Peru, and Bolivia. In Colombia and along its borders with Venezuela, Ecuador, and Peru, much of the coca-growing territory remains under the control of the Revolutionary Armed Forces of Colombia, or FARC. A guerrilla organization founded in the 1960s as a Marxist-Leninist revolutionary movement dedicated to the overthrow of the Colombian government, the FARC embraced coca growing in the 1990s as a means of funding its operations and has subsequently evolved into a hybrid mix of left-wing insurgent group and pro􀂿t-driven cartel.76 This hybrid nature has facilitated cooperation between the FARC and ideological sympathizers like the Bolivarian Alliance, Hezbollah, Al Qaeda in the Islamic Maghreb, and other extremist groups77 as well as with purely criminal organizations like the Mexican cartels. Although the FARC has been greatly weakened over the past decade and no longer poses the existential threat to the Colombian government that it once did, it remains 􀂿rmly in control of large tracts of coca-producing jungle, mostly straddling the borders between Colombia and FARC supporters Venezuela and Ecuador. In summary, organized crime elements have exploited under-governed areas to establish zones under their de facto control. In so doing they pose a signi􀂿cant and growing threat to regional security in general and U.S. interests in particular. As SOUTHCOM commander General Kelly recently observed: 􀀾T􀁀he proximity of the U.S. homeland to criminally governed spaces is a vulnerability with direct implications for U.S. national security. I am also troubled by the signi􀂿cant criminal capabilities that are available 􀀾within them􀁀 to anyone—for a price. Transnational criminal organizations have access to key facilitators who specialize in document forgery, trade-based money laundering, weapons procurement, and human smuggling, including the smuggling of special interest aliens. This criminal expertise and the ability to move people, products, and funds are skills that can be exploited by a variety of malign actors, including terrorists.78 Hezbollah and the Bolivarian Alliance Hezbollah in Latin America 􀀱on-state entities recognized by the U.S. as terrorist organizations also operate in the region, most notably Lebanon-based Hezbollah, an Iranian client group. Hezbollah maintains an active presence in the tri-border area (TBA) of South America— the nexus of Argentina, Brazil, and Paraguay—stretching back to the 1980s. The TBA has traditionally been under-governed and is known by some as “the United 􀀱ations of crime.”79 Eight syndicate groups facilitate this activity in South America’s so-called “Southern Cone,” overseeing legitimate businesses along with a wide range of illegal activities to include money laundering, drug and arms traf- 􀂿cking, identity theft and false identi􀂿cation documents, counterfeiting currency and intellectual property, and smuggling. 􀀱ot surprisingly they are linked to organized crime and to non-state insurgent and terrorist groups, such as the FARC.80 Estimates are that over 􀀇12 billion in illicit transactions are conducted per year, a sum exceeding Paraguay’s entire GDP by a substantial amount.81 Hezbollah achieved notoriety in the region in 1992 when it bombed the Israeli embassy in Argentina. This was followed with the bombing of the AMIA Jewish community center in Buenos Aires two years later. Like many other terrorist organizations, as Hezbollah expanded it established relationships with drug cartels82 that it supports in a variety of ways. For example, the cartels have enlisted Hezbollah, known for its tunnel construction along the Israeli border, for help in improving their tunnels along the U.S.-Mexican border. In 2008, Hezbollah helped broker a deal in which one of Mexico’s major drug cartels, Sinaloa, sent members to Iran for weapons and explosives training via Venezuela using Venezuelan travel documents. 83 As the locus of the drug trade and other illegal cartel activities moved north into Central America and Mexico, Hezbollah has sought to move with it with mixed success. In October 2011, Hezbollah was linked to the e􀌆orts of an Iranian-American to conspire with Iranian agents to assassinate the Saudi ambassador to the United States. The plot involved members of the Los Zetas Mexican drug cartel.8􀀗 The would-be assassin, Mansour Arbabsiar, had established contact with his cousin, a Quds Force85 handler, Gen. Gholam Shakuri. The plot is believed by some to be part of a wider campaign by the Quds Force and Hezbollah to embark on a campaign of violence extending beyond the Middle East to other Western targets, including those in the United States.86 In early September 2012, Mexican authorities arrested three men suspected of operating a Hezbollah cell in the Yucatan area and Central America, including a dual U.S.-Lebanese citizen linked to a U.S.-based Hezbollah money laundering operation. 87A few months later, in December 2012, Wassim el Abd Fadel, a suspected Hezbollah member with Paraguayan citizenship, was arrested in Paraguay. Fadel was charged with human and drug tra􀌇cking and money laundering. Fadel reportedly deposited the proceeds of his criminal activities—ranging from 􀀇50-200,000 per transaction—into Turkish and Syrian bank accounts linked to Hezbollah. In summary, Hezbollah has become a 􀂿xture in Central and Latin America, expanding both its activities and in􀃀uence over time. It has developed links with the increasingly powerful organized crime groups in the region, particularly the narco cartels, along with radical insurgent groups such as the FARC and states like Venezuela who are hostile to the United States and its regional partners. Hezbollah’s principal objectives appear to be undermining U.S. in􀃀uence in the region, imposing costs on the United States, and generating revenue to sustain its operations in Latin America and elsewhere in the world. These objectives are shared by Iran, Hezbollah’s main state sponsor. The Bolivarian Alliance As noted above, geographic, economic, and cultural factors have traditionally helped to prevent the emergence in Latin America of any real military rival to the United States. Although there are no traditional military threats in the region, there are indigenous states whose actions, policies, and rhetoric challenge regional stability and U.S. security. Over the past decade, several states have come together to form the Bolivarian Alliance of the Americas (ALBA), an organization of left-leaning Latin American regimes whose overarching purpose is to promote radical populism and socialism, foster regional integration, and reduce what they perceive as Washington’s “imperialist” influence in the region.89 Since its founding by Hugo Chavez of Venezuela and Fidel Castro of Cuba in December 200􀀗, the Bolivarian Alliance has expanded to include Antigua and Barbuda, Bolivia, Dominica, Ecuador, 􀀱icaragua, and Saint Vincent and the Grenadines. Although the members of the Bolivarian Alliance are militarily weak and pose almost no traditional military threat to the United States or its allies in the region,90 they challenge American interests in the region in other ways. First, they espouse an anti-American narrative that finds substantial support in the region and consistently oppose U.S. efforts to foster cooperation and regional economic integration.91 Second, in their efforts to undermine the government of Colombia, which they consider to be a U.S. puppet, ALBA states provide support and sanctuaries within their borders to coca growers, drug traffickers, other criminal organizations, and the FARC.92 Links to Hezbollah have also been detected.93 Perhaps of greatest concern, they have aligned themselves closely with Iran, inviting it and Syria to participate as “observer states” in the alliance. Other worrisome ALBA activities involve lifting visa requirements for Iranian citizens and hosting large numbers of Iranian diplomats and commercial exchange members that some observers believe to be Iranian intelligence and paramilitary Quds Force operatives.9􀀗 By hosting and cooperating with both foreign agents and violent non-state actors, the ALBA states have come to function as critical nodes in a network of groups hostile to the United States. A Coming Era of Proxy Wars in the Western Hemisphere? History shows that Washington has often emphasized an indirect approach to meeting challenges to its security in Latin America. Yet the United States has not shied away from more direct, traditional uses of force when interests and circumstances dictated, as demonstrated over the past half century by U.S. invasions of the Dominican Republic (1965), Grenada (1983), and Panama (1989) and the occupation of Haiti (199􀀗).Yet several trends seem likely to raise the cost of such operations, perhaps to prohibitive levels. Foremost among these trends is the diffusion of precision-guided weaponry to state and non-state entities. 92 The Second Lebanon War as “Precursor” War A precursor of this trend can be seen in the Second Lebanon War between Israel and Hezbollah.95 During the con􀃀ict, which lasted less than 􀂿ve weeks, irregular Hezbollah forces held their own against the highly regarded Israeli Defense Force (IDF), demonstrating what is now possible for non-state entities to accomplish given the proliferation of militarily-relevant advanced technologies. Hezbollah’s militia engaged IDF armor columns with salvos of advanced, man-portable, antitank guided missiles and other e􀌆ective anti-armor weapons (e.g. rocket-propelled grenades (RPGs) with anti-armor warheads) in great numbers. When the IDF employed its ground forces in southern Lebanon, its armored forces su􀌆ered severe losses; out of the four hundred tanks involved in the 􀂿ghting in southern Lebanon, forty-eight were hit and forty damaged.96 Hezbollah’s defensive line was also well equipped with latest-generation thermal and low-/ no-light enhanced illumination imaging systems, while frontline units were connected to each other and higher command elements via a proprietary, 􀂿ber-optic based communications network, making collection of communications tra􀌇c by Israeli intelligence extremely di􀌇cult. Perhaps most important, Hezbollah possessed thousands of short- and medium- range rockets, often skillfully hidden below ground or in bunkers that made detection from overhead surveillance platforms nearly impossible. During the brief con􀃀ict Hezbollah’s forces 􀂿red some four thousand unguided rockets of various types that hit Israel. Hezbollah’s rocket inventory enabled its forces to attack targets throughout the northern half of Israel. Over nine hundred rockets hit near or on buildings, civilian infrastructure, and industrial plants. Some two thousand homes were destroyed, and over 􀂿fty Israelis died with several thousand more injured. The casualties would undoubtedly been greater if between 100,000 and 250,000 Israeli civilians had not 􀃀ed their homes. Haifa, Israel’s major seaport had to be shut down, as did its oil re􀂿nery.97 Hezbollah also employed several unmanned aerial vehicles for surveillance of Israel, as well as C-802 anti-ship cruise missiles used to attack and damage an Israeli corvette. 98 The G-RAMM Battlefield The brief war between Israel and Hezbollah suggests that future irregular forces may be well-equipped with enhanced communications, extended-range surveillance capabilities, and precision-guided rockets, artillery, mortars and missiles (G-RAMM) 99 able to hit targets with high accuracy at ranges measured from the tens of kilometers perhaps up to a hundred kilometers or more. In projecting power against enemies equipped in this manner and employing these kinds of tactics U.S. forces—as well as other conventional forces— will find themselves operating in a far more lethal battlefield than those in either of the Gulf wars or in stability operations in Afghanistan and Iraq. Moreover, currently constituted conventional forces typically depend on large fixed infrastructure (e.g., military bases, logistics depots, ports, airfields, railheads, bridges) to deploy themselves and sustain combat operations. These transportation and support hubs also serve as the nodes through which internal commerce and foreign trade moves within a country. This key, fixed infrastructure will almost certainly prove far more difficult to defend against irregular forces armed with G-RAMM weaponry. Indeed, had Hezbollah’s “RAMM” inventory had only a small fraction of G-RAMM munitions, say 10-20 percent, it would have been able to in􀃀ict far greater damage than it did historically to Israeli population centers, key government facilities, military installations, and essential commercial assets such as ports, air􀂿elds, and industrial complexes. An irregular enemy force armed with G-RAMM capabilities in substantial numbers could seriously threaten Latin American governments as well as any U.S. (or external great power) forces and support elements attempting a traditional intervention operation. Implications for the U.S. and Other Major Powers The preceding narrative suggests that the combat potential of irregular forces is likely to increase dramatically in the coming years. As this occurs, the cost of operating conventional forces—especially ground forces—and defending key military support infrastructure is likely to rise substantially. Given these considerations the United States and other major powers external to the Western Hemisphere will have strong incentives to avoid the use of conventional forms of military power, particularly large ground forces, in favor of employing irregular proxy forces to advance their interests. Moreover, the high cost and questionable bene􀂿t of the campaigns in Afghanistan and Iraq are likely to create strong domestic opposition in the United States to such operations for some time to come. This must be added to the United States’ greatly diminished 􀂿scal standing that has led to large cuts in planned investments in defense. These factors suggest that Washington will be much less likely to engage in direct military action in Latin America in the coming years than historically has been the case. At the same time, rivals of the United States like China and Russia may be incentivized by these trends, as well as the United States’ overwhelming military dominance in the Western Hemisphere, to avoid the direct use of force to expand their in􀃀uence in Latin America. Instead, like some of the Bolivarian Alliance members, they appear likely to follow the path taken by the Soviet Union during the Cold War and Iran today: supporting non-state proxies to impose disproportionate costs on the United States and to distract Washington’s resources and attention from other parts of the world. This is not to say that Beijing, Moscow, and Tehran would eschew future opportunities to establish bases in Latin America. As in the past, such bases can support efforts to accomplish several important objectives. They can, for example, further insulate a Latin American regime from the threat of direct U.S. military intervention, since Washington would have to account for the possibility that the conflict would lead to a direct confrontation with a more capable and potentially nuclear-armed power .100 Bases in the hemisphere can also enable external powers to conduct military assistance activities, such as training, more easily. Electronic surveillance of the United States and Latin American states could be accomplished more cheaply and e􀌆ectively from forward positions. Finally, certain kinds of military capabilities, such as long-range ballistic missiles and attack submarines, could be pro􀂿tably stationed in Latin America by powers external to that region, particularly if they intended to create the option of initiating con􀃀ict at some future date. These reasons, among others, have made preventing an extra-hemispheric power from establishing bases in Latin America an enduring U.S. priority. Players in a Latin American Great Game Given current trends, several powers external to the region may, either now or over the coming decade, have both the motive and the means to employ both state and non-state proxies in Latin American to achieve their interests. Principal among them is Iran, which is already engaged in supporting proxies against the United States and its partners in the Middle East and has long been developing proxies in Latin America. Additionally, there are reasons to think that China and Russia may be interested in cultivating and supporting Latin American proxies as well.

#### Nuke war causes extinction – Ice Age, famines, and war won’t stay limited

Edwards 17 [Paul N. Edwards, CISAC’s William J. Perry Fellow in International Security at Stanford’s Freeman Spogli Institute for International Studies. Being interviewed by EarthSky. How nuclear war would affect Earth’s climate. September 8, 2017. earthsky.org/human-world/how-nuclear-war-would-affect-earths-climate] Note, we are only reading parts of the interview that are directly from Paul Edwards -- MMG

In the nuclear conversation, what are we not talking about that we should be?

We are not talking enough about the climatic effects of nuclear war. The “nuclear winter” theory of the mid-1980s played a significant role in the arms reductions of that period. But with the collapse of the Soviet Union and the reduction of U.S. and Russian nuclear arsenals, this aspect of nuclear war has faded from view. That’s not good. In the mid-2000s, climate scientists such as Alan Robock (Rutgers) took another look at nuclear winter theory. This time around, they used much-improved and much more detailed climate models than those available 20 years earlier. They also tested the potential effects of smaller nuclear exchanges. The result: an exchange involving just 50 nuclear weapons — the kind of thing we might see in an India-Pakistan war, for example — could loft 5 billion kilograms of smoke, soot and dust high into the stratosphere. That’s enough to cool the entire planet by about 2 degrees Fahrenheit (1.25 degrees Celsius) — about where we were during the Little Ice Age of the 17th century. Growing seasons could be shortened enough to create really significant food shortages. So the climatic effects of even a relatively small nuclear war would be planet-wide. What about a larger-scale conflict? A U.S.-Russia war currently seems unlikely, but if it were to occur, hundreds or even thousands of nuclear weapons might be launched. The climatic consequences would be catastrophic: global average temperatures would drop as much as 12 degrees Fahrenheit (7 degrees Celsius) for up to several years — temperatures last seen during the great ice ages. Meanwhile, smoke and dust circulating in the stratosphere would darken the atmosphere enough to inhibit photosynthesis, causing disastrous crop failures, widespread famine and massive ecological disruption. The effect would be similar to that of the giant meteor believed to be responsible for the extinction of the dinosaurs. This time, we would be the dinosaurs. Many people are concerned about North Korea’s advancing missile capabilities. Is nuclear war likely in your opinion? At this writing, I think we are closer to a nuclear war than we have been since the early 1960s. In the North Korea case, both Kim Jong-un and President Trump are bullies inclined to escalate confrontations. President Trump lacks impulse control, and there are precious few checks on his ability to initiate a nuclear strike. We have to hope that our generals, both inside and outside the White House, can rein him in. North Korea would most certainly “lose” a nuclear war with the United States. But many millions would die, including hundreds of thousands of Americans currently living in South Korea and Japan (probable North Korean targets). Such vast damage would be wrought in Korea, Japan and Pacific island territories (such as Guam) that any “victory” wouldn’t deserve the name. Not only would that region be left with horrible suffering amongst the survivors; it would also immediately face famine and rampant disease. Radioactive fallout from such a war would spread around the world, including to the U.S. It has been more than 70 years since the last time a nuclear bomb was used in warfare. What would be the effects on the environment and on human health today? To my knowledge, most of the changes in nuclear weapons technology since the 1950s have focused on making them smaller and lighter, and making delivery systems more accurate, rather than on changing their effects on the environment or on human health. So-called “battlefield” weapons with lower explosive yields are part of some arsenals now — but it’s quite unlikely that any exchange between two nuclear powers would stay limited to these smaller, less destructive bombs.

#### Plan – the member nations of the World Trade Organization ought to delay patent enforcement for cannabis.

Kellner 21 “Mitigating the Effects of Intellectual Property Colonialism on Budding Cannabis Markets” Hughie Kellner [Hughie Kellner came from the small farm town of Uvalde, Texas and received a bachelor’s degree in Physics from the University of Texas at Austin. Upon graduation from the Indiana University Maurer School of Law, Hughie will deploy his physics degree while prosecuting patents in the Frankfurt am Main, Germany office of Leydig, Voit, & Mayer. After Hughie’s first year at Maurer, he worked for a law firm in Thailand as a Stewart Fellow.] Indiana Journal of Global Legal Studies Vol. 28 #1 (Winter 2021) <https://www.repository.law.indiana.edu/ijgls/vol28/iss1/9/> SM

* Includes enforcement and duration

A simple solution to the problem is this: if a nation, or jurisdiction, provides for some new use of cannabis, be it medicinal, recreational, or scientific, the legislation or decision doing so should be accompanied by a law stating that patents may not be enforced as they relate to the subject matter legalized (cannabis strains, methods for ingesting/using, etc.) for some determinate amount of time, after which, patents may be acquired.105 This, at first glance, may seem to some patent attorneys to be a drastic solution as opposed to, for example, compulsory licensing106 or some other means that does not abscond with the rights demanded by international agreements. In support of my proposal, I will first explain why banning enforcement for a certain period yet keeping patent acquisition is desired, rather than banning patent acquisition altogether, as a means of highlighting the benefits that will accrue from the proposed change. Second, I will argue that imposing patent enforcement during the beginning stages of a jurisdiction’s cannabis market development is difficult to justify, as the incentives that patent enforcement are supposed to bring about already exist in great strength, leaving little for the patent sacrifice to provide.

\*\*Footnote 105: There are many aspects of this solution that this note will not address. One of those aspects is the exact duration. All that is addressed is that duration should be less than the full term of a patent for reasons advanced herein. Further, it is assumed that the exact suitable duration is better adjusted to the economic capabilities of the relevant jurisdiction than uniformly imposed. Another aspect is how the solution should be implemented. This effect, of a patent being filed but not yet enforceable for a significant portion of its term of protection, is not uncommon in the pharmaceutical world where a drug may take ten to fifteen, even eighteen years to get approved, and is only enforceable for the remainder of the twenty years since it was filed, leaving possibly two years to do. Therefore, the solution proposed may occur on its own in some medicinal cannabis markets that have long drug patent examination periods, such as Thailand, specifically. That is why the solution proposed does not come with a specified form of implementation; the same goal may be achieved through controlling varying means and portions of the patent application process.

#### The plan solves by reigning in monopolies without killing innovation.

Kellner 21 “Mitigating the Effects of Intellectual Property Colonialism on Budding Cannabis Markets” Hughie Kellner [Hughie Kellner came from the small farm town of Uvalde, Texas and received a bachelor’s degree in Physics from the University of Texas at Austin. Upon graduation from the Indiana University Maurer School of Law, Hughie will deploy his physics degree while prosecuting patents in the Frankfurt am Main, Germany office of Leydig, Voit, & Mayer. After Hughie’s first year at Maurer, he worked for a law firm in Thailand as a Stewart Fellow.] Indiana Journal of Global Legal Studies Vol. 28 #1 (Winter 2021) <https://www.repository.law.indiana.edu/ijgls/vol28/iss1/9/> SM

Patents may still be sought and possibly even acquired if the government so chooses. In this way, examiners will not introduce a new subject matter eligibility analysis changing the fundamental scheme of patentability. Rather, examiners will process the patent as normal, under conditions that actors within the patent system understand, reducing frustration with changing subject matter eligibility rules that are already ambiguous.107 Further, if the promulgating body determines that the window invalidating patent enforcement should be shorter than the patent term would last, there is a benefit for all actors involved. The reasoning supporting a patent enforcement ban rather than a patent acquisition ban rests on five principles.

First, the entity filing the patent will still receive monopoly protection for its invention, albeit with a shorter window than usual. Thus, the incentive to file a patent and disclose the invention to the public still exists, and in a lucrative market such as that for cannabis, a smaller window of monopoly can be compensated by the higher value of that window, which could bring the perceived benefit from a patent back to usual levels.108

Second, if the invention is conceived during the enforcement ban, patent acquisition would allow inventions to be processed just as patents. By allowing patent processing before and after the ban, the legal regime will reduce administrative costs and increase legal certainty.109 By comparison, a system where patent acquisition is prohibited until after the ban would only result in a complex scheme whereby prior use, prior art, and other novelty requirements are handled.

Third, if actors are utilizing technology under such currently unenforceable but soon-to-be enforceable patents, they will have clear notice when they must cease such infringing action, and either close their doors or develop a compliant way of doing business. Thus, actors in the market can establish themselves and then innovate their own means of carrying out business or license it from those who do. This is the exact action patents are meant to incentivize, innovating new solutions to problems,

even if the problem here is merely a legal one.110

Fourth, after the cannabis market sustains established actors, the cannabis market may find that the benefits of promoting more actors in the market111—the purpose of barring patent enforcement—are once again outweighed by the value of the incentives that the patent system provides.112 Setting a time period for when patent enforcement will return ensures that the market is not devoid of the incentives once the initial “green rush”113 wears off.

Fifth, this solution bans foreign monopolies, not foreign participation. This solution does not inhibit foreign companies from moving their business to local markets if the legal regime allows.114 With the ability to move their intellectual property portfolio, foreign companies can still acquire a trademark and operate their business plan, benefitting from the experience acquired in the prior years of operation. Foreign participants, just like domestic participants, cannot monopolize their innovations, and are thus placed on an equal footing.