## t- cannabis not a medicine

#### Interp: The aff must defend reducing patent enforcements for medicines

#### Cannabis isn’t a medicine – most predictable definition

**CDC 10-15-2018** [Center for Disease Control, 10-15-2018, "Is marijuana medicine?," No Publication, https://www.cdc.gov/marijuana/faqs/is-marijuana-medicine.html, accessed 9-6-2021 azhang]

The marijuana plant has chemicals that may help symptoms for some health problems. More and more states are making it legal to use the plant as medicine for certain conditions. But there isn’t enough research to show that the whole plant works to treat or cure these conditions. Also, the U.S. Food and Drug Administration (FDA)External has not recognized or approved the marijuana plant as medicine.\

#### Marijuana is not Medicine

Mosley, 20 Mark, MD, MPH. "Medical Marijuana Is a Dangerous Lie." Emergency Medicine News https://journals.lww.com/emnews/fulltext/2020/08000/viewpoint\_\_medical\_marijuana\_is\_a\_dangerous\_lie.27.aspx

Marijuana is not a medical drug. It is a slang term for a plant of the *Cannabis* family that contains more than 60 different cannabinoid substances and more than 80 biologically active compounds. Using the term marijuana in place of THC would be like using willow tree in place of acetylsalicylic acid, the active ingredient in aspirin. Even worse would be creating a multibillion-dollar industry using the term medical willow tree for a product that may not even contain acetylsalicylic acid. The consequences of peddling the term medical marijuana are far graver, however, than simply confusing a whole plant with one of its active ingredients.

Madras,16 Bertha Madras. “5 Reasons Marijuana is not medicine”. The Washington Post <https://www.washingtonpost.com/news/in-theory/wp/2016/04/29/5-reasons-marijuana-is-not-medicine/>

Yet unlike drugs approved by the Food and Drug Administration, “dispensary marijuana” has no quality control, no standardized composition or dosage for specific medical conditions. It has no prescribing information or no high-quality studies of effectiveness or long-term safety.

To approve a medicine, the FDA requires five criteria to be fulfilled:

1. **The drug’s chemistry must be known and reproducible.** Evidence of a standardized product, consistency, ultra-high purity, fixed dose and a measured shelf life are required by the FDA. The chemistry of “dispensary marijuana” is not standardized. Smoked, vaporized or ingested marijuana may deliver inconsistent amounts of active chemicals. Levels of the main psychoactive constituent, THC, can vary from 1 to 80 percent. Cannabidiol (known as CBD) produces effects opposite to THC, yet THC-to-CBD ratios are unregulated.
2. **There must be adequate safety studies.** “Dispensary marijuana” cannot be studied or used safely under medical supervision if the substance is not standardized. And while clinical research on long-term side effects has not been reported, drawing from recreational users we know that marijuana impairs or degrades brain function, and intoxicating levels interfere with learning, memory, cognition and driving. Long-term use is associated with addiction to marijuana or other drugs, loss of motivation, reduced IQ, psychosis, anxiety, excessive vomiting, sleep problems and reduced lifespan. Without a standardized product and long-term studies, the safety of indefinite use of marijuana remains unknown.
3. **There must be adequate and well-controlled studies proving efficacy.** Twelve meta-analyses of clinical trials scrutinizing smoked marijuana and cannabinoids[conclude that there is](http://jama.jamanetwork.com/article.aspx?articleid=2338251)[no or insufficient evidence](http://www.ncbi.nlm.nih.gov/pubmed/25896576) for the use of smoked marijuana for specific medical conditions. There are no studies of raw marijuana that include high-quality, unbiased, blinded, randomized, placebo-controlled or long-duration trials.
4. **The drug must be accepted by well-qualified experts.** Medical associations generally call for more cannabinoid research but do not endorse smoked marijuana as a medicine. The American Medical Association: “Cannabis is a dangerous drug and as such is a public health concern”; the American Academy of Child and Adolescent Psychiatry: “Medicalization” of smoked marijuana has distorted the perception of the known risks and purposed benefits of this drug;” the American Psychiatric Association: “No current scientific evidence that marijuana is in any way beneficial for treatment of any psychiatric disorder … the approval process should go through the FDA.”
5. **Scientific evidence must be widely available.** The evidence for approval of medical conditions in state ballot and legislative initiatives did not conform to rigorous, objective clinical trials nor was it widely available for scrutiny.

Marijuana fails to meet any of these five criteria for accepted medical use in the United States.

#### Violation: they defend just “cannabis” – not specifically medical either

#### Vote neg for limits because they can defend any arbitrary medicine that isn’t in the core of the literature for treating disease which is the core topic controversy. Their interp always allows them to shift the goalposts, and functional limits can’t check because there are tons of affs that wouldn’t involve diagnosis, but are still unpredictable

#### Vote on competing interps because anything else is arbitrary and unfair

#### T is a voter because they have made this debate impossible for the neg.

## Indigenous Medicines PIC

#### Indigenous people need strong intellectual property rights to traditional medicines – their unique medicinal knowledge is open to appropriation and theft from larger Western pharmaceutical companies without it – Sinela and Ramcharan ‘05

SINJELA, MPAZI, and ROBIN RAMCHARAN. “Protecting Traditional Knowledge and Traditional Medicines of Indigenous Peoples through Intellectual Property Rights: Issues, Challenges and Strategies.” International Journal on Minority and Group Rights, vol. 12, no. 1, 2005, pp. 1–24. LK

At one stage a desire began to emerge in indigenous circles for a forum in the United Nations that dealt not only with human rights issues but with the broad range of environmental, developmental and cultural issues affecting indigenous populations. This led to calls for the establishment, as a subsidiary body of the ECOSOC, of a permanent forum on indigenous issues. This forum was finally established in 2000 and met for the first time at UN headquarters in New York in the summer of 2002.9 The Permanent Forum has thus far held three sessions. As of the time of writing there is a debate going on whether the buo Commission's Working Group on Indigenous Populations should be continued in the light of the establishment of the Permanent Forum. Some governments have apparently favored the discontinuance of the Working Group while indigenous peoples favor its continuation. At the Summer Session of the ECOSOC in 2004 the Secretary General of the United Nations submitted a report summarizing the views of States and indigenous organizations on this issue, and, as of the time of writing, the issue still remains open. The study by Mr. Martinez Cobo, the Working Group on Indigenous issues, the working group on a draft declaration and the Permanent Forum have thus been the main building blocks within the United Nations in the past four decades to advance the human rights of indigenous peoples. In the course of their work, they have, inter alia, highlighted the need for the protection of the intellectual property rights of indigenous peoples. Following on from the work of Mr. Martinez Cobo, cultural heritage and intellectual property have been issues of interest to the Working Group. In 1992, the Working Group and the World Intellectual Property Organization (WIPO) held a Technical Conference on Indigenous peoples at which participants recommended that the United Nations develop more effective measures to protect the intellectual and cultural property rights of indigenous peoples.10 A 1993 report by Erica Daes, Chairperson of the Working Group, on the protection of cultural and intellectual property, noted that the term "'indigenous' embraces the notion of a distinct and separate culture and way of life, based on long-held traditions and knowledge which are connected, fundamentally, to a specific territory. Indigenous peoples cannot survive, or exercise their fundamental human rights as distinct nations, societies and peoples, without the ability to conserve, revive, develop and teach the wisdom they have inherited from their ancestors."" The Chairperson was "compelled to the conclusion" that the distinction between cultural and intellectual property, from the indigenous viewpoint, was an artificial one. Indeed, "Industrialized societies tend to distinguish between art and science, or between creative inspiration and logical analysis. Indigenous peoples regard all products of the human mind and heart as interrelated, and as flowing from the same source: the relationship between the people and their land, their kinship with other living creatures that share the land, and with the spirit world. Since the ultimate source of knowledge and creativity is the land itself, all of the art and science of a specific people are manifestations of the same underlying relationship, and can be considered as manifestations of the people as a whole."12 It is not a coincidence that Article 8(j) of the 1992 Convention on Biological Diversity (CBD) adopted at the Rio Earth Summit, creates legal obligations for States party to respect, preserve and maintain knowledge, innovations and practices of indigenous people related to the conservation and sustainable use of bio diversity. The protection of cultural and intellectual property "is connected fundamentally with the realization of the territorial rights and self determination of indigenous peoples".13 The Chairpersons' report noted that the Working Group had received news from "indigenous representatives from every continent about the priority and urgency they attach to the protection of their spiritual and cultural life, arts and scientific and medical knowledge".14Consequently, the Draft Declaration prepared by the Sub-Commission, while recognizing in its preamble the "inherent rights and characteristics of indigenous peoples, especially their rights to their lands, territories and resources," provided for the right to fully participate, inter alia, in the cultural life of the State (Article 4), the right to revitalize and practice their cultural traditions (Article 11), the right to revitalize, use, develop and transmit to future generations their language, oral traditions, writing systems and literatures (Article 13) and, more importantly for present purposes, "the right to their traditional medicines and health practices, including the right to the protection of vital medicinal plants, animals and minerals" (Article 22). In this vein, the draft Article 27 provides that "[indigenous peoples have the right to special measures to protect, as intellectual property, their sciences, technologies and cultural manifestations, including genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs and visual performing arts". Moreover, Article 28 provides that States should seek the free and informed consent of indigenous peoples "prior to commencement of any projects on their lands and territories, particularly in connection with natural resource development or exploitation of mineral or other sub-surface resources".15 In December 1995, to give impetus to the Decade for Indigenous People, the UN General Assembly adopted a Program of activities aimed at strengthening international cooperation for the solution of problems faced by indigenous people in such areas as human rights, the environment, development, health, culture and education. Among the specific actions to be taken were: (i) "the promotion and protection of the rights of indigenous people and their empowerment to make choices which enable them to retain their cultural identity while participating in political, economic and social life, with full respect for their cultural values, languages, traditions and forms of social organization" and (ii) a request for specialized agencies of the UN system and other international and national agencies, as well as communities and private enterprises, "to devote special attention to development activities of benefit to indigenous peoples".16 WIPO has responded accordingly and the report by the Coordinator of the UN Decade for Indigenous Peoples has noted that WIPO's response "has been dramatic" as there is an entire division as part of the regular budget which is now responsible for traditional knowledge and related issues.17 The Permanent Forum has maintained a keen interest in traditional knowledge, soliciting information from all relevant parts of the UN system, notably WIPO.18 The last three sessions of WIPO have focused on its activities in the areas of intellectual property and genetic resources, traditional knowledge and traditional cultural expressions, and are described in greater detail below. Before proceeding to a consideration of the protection of the intellectual property rights of indigenous peoples, we shall in the next section, examine a major heritage of indigenous peoples - traditional medicine. TM, an important part of TK, refers to medicines used by local, tribal and indigenous communities. Such medicine is often herbal and sometimes combined with spiritual elements, such as those practiced by the shaman in tribal communities.19 TM has been refined over centuries of practice by communities who have inherited knowledge from their ancestors. For example, Felix, a member of the Arawak indigenous community of Guyana who works in the Shanklands resort on the banks of Essequibo River, conveyed his impressive knowledge of his community's medicinal uses of various plants and trees in the tropical rainforest. Using the native names of trees, he related the use of the 'yarula' tree for preventing and curing malaria, the use of the 'kakaballi' tree for treating diarrhea and the use of the 'capadulla' tree as a local viagra.20 While relying on textbooks for the Latin names, Felix's knowledge came from his father, the shaman in his community and from inherited knowledge among his people. Thus, often such knowledge is held communally and does not 'belong' to any single person or entity. Equally often, such knowledge cross-cuts communities as well as territorial boundaries. These aspects have implications for intellectual property protection, which we will consider below. The type of TM differs from community to community depending on the type of healing system that is historically prevalent. Until recently non-western healing systems and medicines were disregarded by western health systems, which insist on the development of medicines and healing techniques based on scientific proof and testing. Centuries-old healing systems of the world, such as Chinese traditional medicine and Indian Ayurveda, were given scant attention as the 'scientific' approach was allegedly missing. In Chinese medicine, for example, "disease is viewed as a disharmony of the various elements of the body and the personality of the patient. Chinese therapeutic thought concerns the entire organism's balance, rather than being devoted to clearly localizing and defining the nature of the illness" as in western medicine.21 The argument that non-western medicine is not based on scientific evidence may well ignore the centuries of trial and error, which has actually gone into making a particular medicine or remedy appropriate to a given community. Western science has grudgingly accepted alternative healing systems. However, they have readily sought after TK/IK, which could lead to the production of new drugs, "especially since the cost of putting new drugs on the market is becoming very high".22 Erica Daes noted in her 1993 report, cited above, that studies found that "using traditional knowledge increased the efficiency of screening plants for medical properties by more than 400 percent".23 Already by 1993, estimates of the total world sales of products derived from traditional medicines ran as high as USD 43 billion.24 However, only a tiny fraction of the profits are returned to the indigenous peoples and local communities. For example, it was estimated in the early 1990s, "that less than 0.001 per cent of profits from drugs developed from natural products and traditional knowledge accrue to the traditional people who provided technical leads for research".25 Attempts by Western governments and drug producing companies to harness such TK and TM for their own benefit have led to phenomena such as 'bio piracy' (theft of genetic resources by 'bioprospectors'). Concern has arisen for the preservation of biological diversity and genetic resources. The United States National Cancer Institute had already, by 1960, began a global program to collect and study naturally occurring substances and had tested some 35,000 plant species and a larger number of micro-organisms by 1981. This process intensified with the advent of research to combat AIDS. Pharmaceutical companies, necessarily driven by profit, have become increasingly aware of the potential economic rewards of TK/TM. Among the major US pharmaceutical companies engaged in screening plant species were Merck and Co., Smithkline Beecham, Monsanto, Sterling and Bristol Meyers. But this creates a conflict with the holders of TK/TM. The problem was stated thus by former Filipino President, Fidel Ramos at a ceremony for the signing of a Traditional and Alternative Health Care Law (R.A. 8423) in Manila on 9 December 1998: "We have looked forward to other nations for new technologies and cures, even for ordinary ailments. Indeed, many other nations have been exploiting the potentials of our own resources, claiming them as their own discoveries without giving due credit to us, and in addition to making tremendous profits at our own expense".26 The problem was recognized by Mrs. Daes in her report in 1993, namely that 'collectors' or bio-prospectors, "do not ordinarily have any formal contractual arrangements ... with the indigenous peoples upon whose knowledge of ecology they may rely. Indigenous people have also objected to alleged appropriation of their bodily substances which is taking place in the context of the Human Genome Diversity Project.28

#### Indigenous people were the first to use marijuana as a drug – racist and colonialist attitudes contributed to the stigma against the drug – that makes it an Indigenous drug covered by the PIC

Ríos 15, Viridiana. "Tracing Back Marijuana Stigma."*ReVista (Cambridge)*, vol. 14, no. 2, 2015, pp. 82-83*. ProQuest*, <https://marlborough.idm.oclc.org/login?url=https://www.proquest.com/scholarly-journals/tracing-back-marijuana-stigma/docview/1654706584/se-2?accountid=3672>. MB/VA

The argument that Campos makes is sound and simple. The origins of the war against drugs lie in the ideological conception that marijuana is dangerous. Such beliefs first emerged in Mexico, linking the substance to violence and madness. The United States adopted the Mexican narrative, stigmatizing marijuana consumption and eventually conducting a militarized war against the substance. ¶ Overall, Campos's text shows that marijuana was stigmatized not because its effects were particularly pernicious but because it was linked to negatively perceived groups such as prisoners and indigenous people. The effects of marijuana were not different from alcohol. Smoking was even less common than drinking. The real problem was that marijuana was linked to indigenous herbalism and oriental traditions, typically perceived as activities that undermined modernity and development. Furthermore, marijuana was said to be consumed by to prisoners as a stimulant that brought its "savagery to the surface" (pg. 152). The author argues that the origin of the war on drugs does not come from marijuana's health effects but from the stigma that surrounded those who used it at an earlier time. ¶ Campos draws on a diversity of historical sources to sustain his claims. As his main source of evidence, the author analyzes 600 newspaper articles (extracted from a survey of 40 thousand issues) from more than a dozen publications that discuss marijuana. The information is filtered and organized into basic descriptive statistics like the distribution of news coverage by newspapers from 1878 to 1920, the frequency of marijuana references, the geography of marijuana use, and even the demographic characteristics of marijuana users and effects as reported by the press. ¶ The story starts around the 16th century, when in 1550 Pedro Quadrado, a conquistador, first introduced marijuana into Mexico. Back then it was considered a strong fiber, used as hemp for various products. Yet marijuana soon started to be used as a drug and, by the 18th century, it was clearly linked to indigenous traditions, used for divinatory purposes and to produce visions or supernatural encounters. ¶ Because of its effects, marijuana became associated with madness and violence. It was pretty much accepted that marijuana produced severe mental illness and promoted physical violence among those who used it. Interestingly, despite the many similarities between "marijuana delirium" and that produced by other substances like alcohol, the former was frequently distinguished as being especially pernicious. ¶ Both social discourse and literature commonly associated marijuana with negative outcomes. Campos uses extracts from classic Latin American novels like Los Bandidos del Río Frío by Manuel Payno and El Periquillo Sarniento by José Joaquín Fernández de Lizardi to show how in Mexico's daily life, the use of marijuana was linked to soldiers, prisoners and other low elements. For literature lovers, the book provides a delightful compendium of quotes and references from the works of accomplished authors, such as Antonio Salinas y Carbo, José Posada, Federico Gamboa and Heriberto Frías, to Guillermo Prieto, José Juan Tablada, Porfirio Barba Jacob and even Emile Zola and Rubén Darío. ¶ Even Mexico's 19th-century liberals stigmatized marijuana, the author argues, as a form of political opposition against Porfirio Díaz's dictatorship (1876-1911). They claimed that the reason why marijuana was used in prisons was because of brutal living conditions. Such conditions were a symbol of "all that was wrong with Díaz's regime" (pg. 143) and its institutional corruption. As a result, liberals portrayed marijuana as one of the many negative consequences indirectly linked to the dictatorship. ¶

#### CP Text: The member nations of the World Trade Organization ought to reduce intellectual property protections for medicines except for those medicines created, discovered, preserved, or primarily used by Indigenous peoples. IP rights for those medicines should be expanded in a flexible and culturally appropriate context according to principles of IP law including but not limited to repression of unfair competition, recognition of rights, equity and benefit-sharing, prior informed consent, full and effective participation of knowledge holders, and an appropriate framework for access as per the Sinjela and Ramcharan card. IP rights should never prevent Indigenous people from taking advantage of their own knowledge.

SINJELA, MPAZI, and ROBIN RAMCHARAN 05 “Protecting Traditional Knowledge and Traditional Medicines of Indigenous Peoples through Intellectual Property Rights: Issues, Challenges and Strategies.” International Journal on Minority and Group Rights, vol. 12, no. 1, 2005, pp. 1–24. // mb-va

The question is whether the existing laws, national and international, govern ing intellectual property allow for the effective protection of traditional knowl edge and folklore in particular. If the laws are not appropriate then is there a need for a sui generis system. On the latter point, a sui generis system must be in function of the needs and demands of the TK holders. As Kongolo and Shyllon note, "the fact is that knowledge that is claimed to have been 'invented' and hence 'patented' and converted into intellectual property is often an existing innovation in traditional or indigenous knowledge systems". With respect to the use of traditional medicinal plants, they posit four main issues for consideration: (1) whether the contribution of traditional knowledge to a final product is the sort of contribution that would allow one or more traditional persons to be considered joint inventor; (2) whether publication of information concerning indigenous plant use would bar the availability of a patent, (3) how to address the problems of compensation in the exploitation of herbal knowledge, and (4) whether devel oping countries should recognize through national legislation the rights of tradi tional flows from industrialized countries.61 Any system of protection must recognize the customary laws under which the knowledge evolved. In this connection, WIPO has noted, in the context of the work of the IGC, that, "the use of private property rights for TK protection should thus be carefully balanced with other policy measures to reflect the char acteristics of the protected TK, the stakeholder interests involved, the customary uses, and custodianship patterns. Most countries which have implemented TK protection have therefore supplemented a limited use of private property rights with a combination of other measures."62 Examples of sui generis initiatives include the combination of the grant of exclusive rights with access regulation in Brazil; combination of defensive protection of native insignia with repression of unfair competition in native Indian products in the United States; and combina tion of exclusive property rights, access regulation and unfair competition law to create tailored TK protection measures in Costa Rica and Portugal. "By learning from such national experiences, the combined or comprehensive approach would thus join different legal doctrines and policy tools which have been identified by Member States and have been proven effective in their jurisdictions in order to achieve an appropriate form of protection."63 Thus a 'bundle of rights and methods' may be best suited for the protection of TK. This combined approach "would result in the availability of TK protec tion through a bundle of rights at the national level, which would include the use of existing IP rights, sui generis measures, and non-IP tools, such as access reg ulation and contractual agreements". 61 T. Kongolo and F. Shyllon, 'Panorama of the Most Controversial IP Issues in Developing Countries', 6 European Intellectual Property Review, p. 260. 62 WIPO, Traditional Knowledge: Policy and Legal Options, WIPO/GRTKF/IC/6/4, 12 December 2003, para. 11. The international dimension of protection is addressed in-depth in doc ument WIPO/GRTKF/IC/6/6. Defensive protection of TK is covered only briefly, since documents WIPO/GRTKF/IC/5/6 and WIPO/GRTK.F/IC/6/8 cover this more extensively. 63 6. Key Legal Issues for the Protection of TK/TM What, then, are the core principles and legal doctrines that must underwrite the protection of TK. For this purpose we rely on WIPO studies undertaken for the IGC.64 The principles and doctrines enumerated below have emerged from exten sive discussions within the IGC on national experiences of TK protection. 6.1. Core Principles First, a comprehensive and combined approach is a starting point. It is recog nized that a comprehensive and TK specific approach must be taken using exist ing IP mechanisms, the repression of unfair competition, the grant of exclusive sui generis rights and/or the application of prior informed consent requirements linked to access regimes. It has been noted that a "bundle of rights" and meth ods might be applied for protection. Such a combined approach is not foreign to conventional IP law. For example, ornamental or visually distinctive aspects of products can be protected by a combination of copyright, individual or unfair competition law. Second, the repression of unfair competition, including appropriation and mis take of distinctive traditional characteristics. This may entail the suppression of any false, misleading or culturally offensive references to TK in the commercial arena, and any false or misleading indications or linkage with or endorsement of TK holders. Third, the principle of recognition of rights of TK holders, pertains to con ventional IP rights arising from innovation and intellectual creativity contained in TK elements, as well as to sui generis exclusive rights that may be available for TK. Aggrieved TK holders should be able to seek remedies for misuse of TK and possibly to gain remuneration and benefit-sharing. Fourth, the principle of prior informed consent (PIC) entails confirming that TK, held by a traditional community should not be accessed, recorded, used or commercialized without the prior informed consent of TK holders. Fifth, the principle of equity and benefit-sharing, entails protecting TK in a manner conducive to social and economic welfare, balancing rights and obliga tions, and the equitable sharing of benefits. "A broad principle of equity is cen tral to IP law, and is also implied in non-IP international legal instruments".65 Sixth, the principle of regulatory diversity, including sectoral distinctions, entails that a comprehensive use of TK protection "may need to reflect distinct policy objectives in specific sectors, and may need to be integrated with several regulatory systems at the national level".66 Distinct measures have been taken in some countries to regulate traditional medicine, traditional agricultural practices, TK associated with genetic resources and tradition-based industries.67 64 Ibid., para. 22. 65 Ibid. 66 Ibid., para. 23. 67 Seventh, a principle of adapting the form of protection to the nature of TK. Whatever law is adopted, that law may be shaped or guided by the particular characteristics of the TK. TK may be disclosed or undisclosed, attributable or unattributable, collectively or individually held, codified or uncodified, and may be defined and bounded by diverse forms of customary laws and protocols."68 Eighth, a principle of effective and appropriate remedies entails "making avail able effective and expeditious remedies such as injunctions and penalties, or mechanisms for payment of use fees or other compensation where there is out right prohibition on third party use".69 Ninth, a principle of safeguarding customary uses entails the encouragement of the use of TK and associated genetic resources, which "should not be restrained by the formal legal protection of TK, nor by other IP rights".70 Tenth, the principle of consistency with access and benefit-sharing frameworks for associated genetic resources entails adopting measures which regulate access to genetic resources and benefit-sharing. Legal protection of TK associated with genetic resources should be coordinated with policy frameworks for associated genetic resources, including conservation, sustainable use and benefit-sharing.71 Related principles governing procedural and consultative process might be con sidered including the principle of full and effective participation of TK holders and the principle of coordination with other relevant fora and processes.72 These principles clearly are geared towards affording maximum flexibility to TK holders, legislators and policy makers. The development of a bundle or menu of legal and policy options, "flexibility can be achieved by drawing selectively on general legal doctrines in order to tailor the form of protection to specific needs, TK subject matter and the legal systems of a given jurisdiction".73 6.2. Legal Doctrines and Policy Tools Various doctrines have been used as policy tools for TK protection in national law. Their selective use "could build a sufficiently versatile doctrinal basis for TK protection". The major doctrines are as follows. The first is the grant of exclusive property rights for TK. Such rights may be communally or collectively held. This is for TK that is distinct and has a clear owner. Existing IP rights have been used to protect TK or TK related subject matter. For example, practitioners of traditional medicine have protected their innovations by using patent rights under patent systems. An example is China, which granted 4479 patents for Traditional Chinese Medicine (TCM) in 2002.74 Where existing exclusive IP rights are deemed to be insufficient to take into 68 Ibid., para. 24. 65 Ibid., para. 25. 70 Ibid., para. 26. 71 Ibid., para. 27. 72 76id., paras. 28-30. 73 76/d., para. 31. 74 The Economist, supra note 43. 21 account the specificities of TK, sui generis rights have been called for. Difficul ties have arisen in this regard: meeting requirements of novelty or originality, and inventive step or non-obviousness; requirements in many IP laws for protected subject-matter to be fixed in material form; and the frequently informal nature of TK and the customary laws and protocols that define ownership; concern that protection systems should correspond to a positive duty to preserve and maintain TK, and not merely provide means to prevent unauthorized use; perceived tension between individualistic notions of IP rights and the sense of collective owner ship of TK; and limitations on the term of protection in IP systems (20 years in the case of patents).75 The second, is the application of the principle of prior informed consent (PIC). This enables a regulatory framework so as to control the use of TK by third par ties and ensure a flow of benefits to the knowledge holders, in ways consistent with the collective nature of TK. The third, is the compensatory liability approach, which would entitle TK holders to compensatory contributions from TK users who borrowed traditional know-how for industrial applications of their own during a specified period of time. This would ensure that TK holders gain a share of the economic and moral rewards resulting from exploitation of such knowledge and at the same time con tribute to ensuring access to such knowledge. The fourth, is repression of unfair competition. The law of unfair competition includes a wide range of remedies, including repression of misleading and decep tive trade practices, unjust enrichment, passing off, and taking of unfair com mercial advantage. The fifth, is recognition of customary laws and protocols, "which functions as a cross-cutting interface with local legal systems in all the above-mentioned tools".76 An African Model Law77 and the sui generis laws of Peru78 and the Philippines79 incorporate customary laws by reference to such laws. 7. Strategies and interim measures These then are the main legal principles and doctrines, which must be consid ered. At the national level, several steps are vital in the search for a functioning and effective TK protection system. 75 Ibid., para. 21. 76 Ibid., para. 45. 77 African Model Law for Protection of the Rights of Local Communities, Farmers and Breeders and the regulation of access to Biological Resources, 2000. 78 See 'Efforts at Protecting Traditional Knowledge: The Experience of Peru', document prepared for WIPO Roundtable on Intellectual Property and Traditional Knowledge, Geneva, 1-2 November 1999. See also WIPO, Intellectual Property Needs and Expectations of Traditional Knowledge Holders. WIPO Report on Fact-finding Missions on Intellectual Property and Traditional Knowledge (1998-1999) Report of Fact Finding missions of the WIPO, Publication No. 768. ™ Philippines Executive Order, No. 247, 1995, Section 2(a). Policy objectives have to be clearly defined for any sui generis system. In the case of TK and TM, for example, the following objectives could be considered: - to create an appropriate system for access to TK - to ensure fair and equitable benefit-sharing for TK - to promote respect, preservation, wider application and development of TK - to provide mechanisms for the enforcement of rights of TK holders; and - to improve the quality of TK-based products and remove low quality tra ditional medicine. (ii) The scope of the subject matter has to be defined and eligible for TK pro tection. The use of appropriate terms and criteria for eligibility has to be clearly spelled out. (iii) Formal requirements for acquisition of rights need to be established. For example, TK protection may be automatic (as in copyright protection which is automatic upon creation of the work) or a formal step may be required, such as registering the TK before protection becomes effective (as in the case of a trademark). (iv) Substantive criteria for eligibility must be established. For example, in Panama's sui generis law, only elements of TK that remain 'traditional', that is intrin sically linked to the community that has originated them, would be pro tected under the sui generis system.80 (v) The nature of rights in TK conferred depends on the legal doctrine or com bination of doctrines used for protection (vi) The scope of rights will determine the degree of control, which the right holder will be able to exercise. Potential rights may include prevention of unauthorized access to protected TK, unauthorized commercial use of such TK, third party claims over protected TK and so on. (vii) Determination of the custodians or beneficiaries. Does an individual or the community own the TK? Is TK understood in the national context to refer to a collective product? This may then dictate the granting of collective rights and not to individuals. On the other hand, distinctive right holders may not be necessary, as collective marks and certification marks may be protected on behalf of a group of beneficiaries. (viii) Expiration and loss of rights. The duration of rights, normally a key issue, may be problematic, as sui generis systems sometimes do not contain expiration and loss of rights provisions. Article 23 of the African Model Law states that community intellectual rights "shall at all times remain inalienable".8' (ix) Sanctions and enforcement. Appropriate mechanisms will need to be devised. Ley de Propiedad Intellectual Indigena, Ley No. 20 (26 June 2000). African Model Law, supra note 77. Defensive protection. This involves, for example, the publication of TK on a digital database, so as to record that a particular community has been using that knowledge. This may avoid the misguided grant of patents men tioned above. (xi) Linkages with benefit sharing schemes. As some TK is closely related to biological and genetic resources, such as when these resources are linked with traditional ways of life, regulation of access to biological resources may serve as a basis for protection of TK. In this regard, related conven tions such as the CBD will have to be closely studied

## Innovation DA

### Bioterror

#### COVID has kept patents and innovation strong, but continued protection is key to innovation by incentivizing biomedical research – it’s also crucial to preventing counterfeit medicines, economic collapse, and fatal diseases, which turns case. Macdole and Ezell 4-29:

Jaci Mcdole and Stephen Ezell, 21 - ("Ten Ways Ip Has Enabled Innovations That Have Helped Sustain The World Through The Pandemic," Information Technology & Innovation Foundation, 4-29-2021, https://itif.org/publications/2021/04/29/ten-ways-ip-has-enabled-innovations-have-helped-sustain-world-through)//marlborough-wr/

To better understand the role of IP in enabling solutions related to COVID-19 challenges, this report relies on 10 case studies drawn from a variety of nations, technical fields, and firm sizes. This is but a handful of the thousands of IP-enabled innovations that have sprung forth over the past year in an effort to meet the tremendous challenges brought on by COVID-19 globally. From a paramedic in Mexico to a veteran vaccine manufacturing company in India and a tech start-up in Estonia to a U.S.-based company offering workplace Internet of Things (IoT) services, small and large organizations alike are working to combat the pandemic. Some have adapted existing innovations, while others have developed novel solutions. All are working to take the world out of the pandemic and into the future. The case studies are: Bharat Biotech: Covaxin Gilead: Remdesivir LumiraDX: SARS-COV-2 Antigen POC Test Teal Bio: Teal Bio Respirator XE Ingeniería Médica: CápsulaXE Surgical Theater: Precision VR Tombot: Jennie Starship Technologies: Autonomous Delivery Robots Triax Technologies: Proximity Trace Zoom: Video Conferencing As the case studies show, IP is critical to enabling innovation. Policymakers around the world need to ensure robust IP protections are—and remain—in place if they wish their citizens to have safe and innovative solutions to health care, workplace, and societal challenges in the future. THE ROLE OF INTELLECTUAL PROPERTY IN R&D-INTENSIVE INDUSTRIES Intangible assets, such as IP rights, comprised approximately 84 percent of the corporate value of S&P 500 companies in 2018.4 For start-ups, this means much of the capital needed to operate is directly related to IP (see Teal Bio case study for more on this). IP also plays an especially important role for R&D-intensive industries.5 To take the example of the biopharmaceutical industry, it is characterized by high-risk, time-consuming, and expensive processes including basic research, drug discovery, pre-clinical trials, three stages of human clinical trials, regulatory review, and post-approval research and safety monitoring. The drug development process spans an average of 11.5 to 15 years.6 For every 5,000 to 10,000 compounds screened on average during the basic research and drug discovery phases, approximately 250 molecular compounds, or 2.5 to 5 percent, make it to preclinical testing. Out of those 250 molecular compounds, approximately 5 make it to clinical testing. That is, 0.05 to 0.1 percent of drugs make it from basic research into clinical trials. Of those rare few which make it to clinical testing, less than 12 percent are ultimately approved for use by the U.S. Food and Drug Administration (FDA).7 In addition to high risks, drug development is costly, and the expenses associated with it are increasing. A 2019 report by the Deloitte Center for Health Solutions concluded that since 2010 the average cost of bringing a new drug to market increased by 67 percent.8 Numerous studies have examined the substantial cost of biopharmaceutical R&D, and most confirm investing in new drug development requires $1.7 billion to $3.2 billion up front on average.9 A 2018 study by the Coalition for Epidemic Preparedness found similar risks and figures for vaccines, stating, “In general, vaccine development from discovery to licensure can cost billions of dollars, can take over 10 years to complete, and has an average 94 percent chance of failure.”10 Yet, a 2010 study found that 80 percent of new drugs—that is, the less than 12 percent ultimately approved by the FDA—made less than their capitalized R&D costs.11 Another study found that only 1 percent (maybe three new drugs each year) of the most successful 10 percent of FDA approved drugs generate half of the profits of the entire drug industry.12 To say the least, biopharmaceutical R&D represents a high-stakes, long-term endeavor with precarious returns. Without IP protection, biopharmaceutical manufacturers have little incentive to take the risks necessary to engage in the R&D process because they would be unable to recoup even a fraction of the costs incurred. Diminished revenues also result in reduced investments in R&D which means less research into cancer drugs, Alzheimer cures, vaccines, and more. IP rights give life-sciences enterprises the confidence needed to undertake the difficult, risky, and expensive process of life-sciences innovation secure in the knowledge they can capture a share of the gains from their innovations, which is indispensable not only to recouping the up-front R&D costs of a given drug, but which can generate sufficient profits to enable investment in future generations of biomedical innovation and thus perpetuate the enterprises into the future.13 THE IMPORTANCE OF INTELLECTUAL PROPERTY TO INNOVATION Although anti-IP proponents have attacked biopharmaceutical manufacturers particularly hard, the reality is all IP-protected innovations are at risk if these rights are ignored, or vitiated. Certain arguments have shown a desire for the term “COVID-19 innovations” to include everything from vaccines, therapeutics, diagnostics, and PPE to biotechnology, AI-related data, and educational materials.14 This could potentially open the floodgates to invalidate IP protection on many of the innovations highlighted in this report. However, much of the current discussion concerning IP focuses almost entirely on litigation fears or R&D incentives. Although R&D is an important aspect of IP, as previously mentioned, these discussions ignore the fact that IP protection can be—and often is—used for other purposes, including generating initial capital to create a company and begin manufacturing and, more importantly, using licensing agreements and IP to track the supply chain and ensure quality control of products. This report highlights but a handful of the thousands of IP-enabled innovations that have sprung forth over the past year in an effort to meet the tremendous challenges brought on by COVID-19 globally. In 2018, Forbes identified counterfeiting as the largest criminal enterprise in the world.15 The global struggle against counterfeit and non-regulated products, which has hit Latin America particularly hard during the pandemic, proves the need for safety and quality assurance in supply chains.16 Some communities already ravaged by COVID-19 are seeing higher mortality rates related to counterfeit vaccines, therapeutics, PPE, and cleaning and sanitizing products.17 Polish authorities discovered vials of antiwrinkle treatment labeled as COVID-19 vaccines. 18 In Mexico, fake vaccines sold for approximately $1,000 per dose.19 Chinese and South African police seized thousands of counterfeit vaccine doses from warehouses and manufacturing plants.20 Meanwhile, dozens of websites worldwide claiming to sell vaccines or be affiliated with vaccine manufacturers have been taken down.21 But the problem is not limited to biopharmaceuticals. The National Intellectual Property Rights Coordination Center has recovered $48 million worth of counterfeit PPE and other products.22 Collaborative efforts between law enforcement and manufacturers have kept numerous counterfeits from reaching the population. In countries with strong IP protection, the chances of counterfeit products reaching the market are significantly lower. This is largely because counterfeiting tends to be an IP-related issue, and these countries generally provide superior means of tracking the supply chain through trademarks, trade secrets, and licensing agreements. This enables greater quality control and helps manufacturers maintain a level of public confidence in their products. By controlling the flow of knowledge associated with IP, voluntary licensing agreements provide innovators with opportunities to collaborate, while ensuring their partners are properly equipped and capable of producing quality products. Throughout this difficult time, the world has seen unexpected collaborations, especially between biopharmaceutical companies worldwide such as Gilead and Eva Pharma or Bharat Biotech and Ocugen, Inc. Throughout history, and most significantly in the nineteenth century through the widespread development of patent systems and the ensuing Industrial Revolution, IP has contributed toward greater economic growth.23 This is promising news as the world struggles for economic recovery. A 2021 joint study by the EU Intellectual Property Office (EUIPO) and European Patent Office (EPO) shows a strong, positive correlation between IP rights and economic performance.24 It states that “IP-owning firms represent a significantly larger proportion of economic activity and employment across Europe,” with IP-intensive industries contributing to 45 percent of gross domestic product (GDP) (€6.6 trillion; US$7.9 trillion).25 The study also shows 38.9 percent of employment is directly or indirectly attributed to IP-intensive industries, and IP generates higher wages and greater revenue per employee, especially for small-to-medium-sized enterprises.26 That concords with the United States, where the Department of Commerce estimated that IP-intensive industries support at least 45 million jobs and contribute more than $6 trillion dollars to, or 38.2 percent of, GDP.27 In 2020, global patent filings through the World Intellectual Property Organization’s (WIPO) Patent Cooperation Treaty (PCT) system reached a record 275,900 filings amidst the pandemic, growing 4 percent from 2019.28 The top-four nations, which accounted for 180,530 of the patent applications, were China, the United States, Japan, and Korea, respectively.29 While several countries saw an increase in patent filings, Saudi Arabia and Malaysia both saw significant increases in the number of annual applications, with the top two filing growths of 73 percent and 26 percent, respectively.30 The COVID-19 pandemic slowed a lot of things, but it certainly couldn’t stop innovation. There are at least five principal benefits strong IP rights can generate, for both developing and developed countries alike.31 First, stronger IP protection spurs the virtuous cycle of innovation by increasing the appropriability of returns, enabling economic gain and catalyzing economic growth. Second, through patents—which require innovators to disclose certain knowledge as a condition of protection—knowledge spillovers build a platform of knowledge that enables other innovators. For instance, studies have found that the rate of return to society from corporate R&D and innovation activities is at least twice the estimated returns that each company itself receives.32 Third, countries with robust IP can operate more efficiently and productively by using IP to determine product quality and reduce transaction costs. Fourth, trade and foreign direct investment enabled and encouraged by strong IP protection offered to enterprises from foreign countries facilitates an accumulation of knowledge capital within the destination economy. That matters when foreign sources of technology account for over 90 percent of productivity growth in most countries.33 There’s also evidence suggesting that developing nations with stronger IP protections enjoy the earlier introduction of innovative new medicines.34 And fifth, strong IP boosts exports, including in developing countries.35 Research shows a positive correlation between stronger IP protection and exports from developing countries as well as faster growth rates of certain industries.36 The following case studies illustrate these benefits of IP and how they’ve enabled innovative solutions to help global society navigate the COVID-19 pandemic.

#### Pharmaceutical innovation is key to protecting against future pandemics, bioterrorism, and antibiotic resistance.

Marjanovic and Fejiao ‘20 Marjanovic, Sonja, and Carolina Feijao. Sonja Marjanovic, Ph.D., Judge Business School, University of Cambridge. Carolina Feijao, Ph.D. in biochemistry, University of Cambridge; M.Sc. in quantitive biology, Imperial College London; B.Sc. in biology, University of Lisbon. "Pharmaceutical Innovation for Infectious Disease Management: From Troubleshooting to Sustainable Models of Engagement." (2020). [Quality Control]

As key actors in the healthcare innovation landscape, pharmaceutical and life sci-ences companies have been called on to develop medicines, vaccines and diagnostics for pressing public health challenges. The COVID-19 crisis is one such challenge, but there are many others. For example, MERS, SARS, Ebola, Zika and avian and swine flu are also infectious diseases that represent public health threats. Infectious agents such as anthrax, smallpox and tularemia could present threats in a **bioterrorism con-text**.1 The general threat to public health that is posed by **antimicrobial resistance** is also **well-recognised** as an area **in need of pharmaceutical innovation**. Innovating in response to these challenges does not always align well with pharmaceutical industry commercial models, shareholder expectations and compe-tition within the industry. However, the expertise, networks and infrastructure that industry has within its reach, as well as public expectations and the moral imperative, make pharmaceutical companies and the wider life sciences sector an **indispensable** partner in the search for solutions that save lives. This perspective argues for the need to establish more sustainable and scalable ways of incentivising pharmaceu-tical innovation in response to infectious disease threats to public health. It considers both past and current examples of efforts to mobilise pharmaceutical innovation in high commercial risk areas, including in the context of current efforts to respond to the COVID-19 pandemic. In global pandemic crises like COVID-19, the urgency and scale of the crisis – as well as the spotlight placed on pharmaceutical companies – mean that contributing to the search for effective medicines, vaccines or diagnostics is **essential** for socially responsible companies in the sec-tor.2 It is therefore unsurprising that we are seeing indus-try-wide efforts unfold at unprecedented scale and pace. Whereas there is always scope for more activity, industry is currently contributing in a variety of ways. Examples include pharmaceutical companies donating existing com-pounds to assess their utility in the fight against COVID-19; screening existing compound libraries in-house or with partners to see if they can be repurposed; accelerating tri-als for potentially effective medicine or vaccine candidates; and in some cases rapidly accelerating in-house research and development to discover new treatments or vaccine agents and develop diagnostics tests.3,4 Pharmaceutical companies are collaborating with each other in some of these efforts and participating in global R&D partnerships (such as the Innovative Medicines Initiative effort to accel-erate the development of potential therapies for COVID-19) and supporting national efforts to expand diagnosis and testing capacity and ensure affordable and ready access to potential solutions.3,5,6 The primary purpose of such innovation is to **benefit patients** and wider **population health**. Although there are also reputational benefits from involvement that can be realised across the industry, there are likely to be rela-tively few companies that are ‘commercial’ winners. Those who might gain substantial revenues will be under pres-sure not to be seen as profiting from the pandemic. In the United Kingdom for example, GSK has stated that it does not expect to profit from its COVID-19 related activities and that any gains will be invested in supporting research and long-term pandemic preparedness, as well as in developing products that would be affordable in the world’s poorest countries.7 Similarly, in the United States AbbVie has waived intellectual property rights for an existing com-bination product that is being tested for therapeutic poten-tial against COVID-19, which would support affordability and allow for a supply of generics.8,9 Johnson & Johnson has stated that its potential vaccine – which is expected to begin trials – will be available on a not-for-profit basis during the pandemic.10 Pharma is mobilising substantial efforts to rise to the COVID-19 challenge at hand. However, we need to consider how pharmaceutical innovation for responding to emerging infectious diseases can best be enabled beyond the current crisis. Many public health threats (including those associated with other **infectious diseases**, **bioterror-ism** agents **and antimicrobial resistance**) are **urgently in need of pharmaceutical innovation**, **even if their impacts are not as visible** to society **as COVID**-19 is in the imme-diate term. The pharmaceutical industry has responded to previous public health emergencies associated with infec-tious disease in recent times – for example those associated with Ebola and Zika outbreaks.11 However, it has done so to a lesser scale than for COVID-19 and with contribu-tions from fewer companies. Similarly, levels of activity in response to the threat of antimicrobial resistance are still **low**.12 There are important policy questions as to whether – and how – industry could engage with such public health threats to an even greater extent under improved innova-tion conditions.

# Case

### Cartels

#### TURN: if companies don’t think that they can make money by investing in cannabis development, then there will be less legal marijuana availability which will strengthen cartels

#### TURN: New entrants into the market are dependent on patents because it protects their inventions from being sold from big Pharma.

#### Zero link to nuke war- no reason why China and Russia would go to war because of Russia exercising control in South America nor a reason why Russia would even be interested in South America

#### IF the availability of marijuana kills cartels, they have to prove that the aff increases the availability of medical marijuana, which they don’t

#### Undeterminable timeframe is another lin k to the innovation da because companies will have no idea how long it will be until their patents are enforced

#### No solvency: If companies can file patents but not enforce them, new companies won’t enter the market because they’ll be sued as soon as patents are enforced again

#### Non-unique- cartels have been strong in Mexico for years; the government isn’t getting stronger

#### Zero solvency- they can’t solve for cartels bc patents don’t prevent new strains of cannabis for entering the market, only medically useful ones

#### Edwards- card is an overblown extinction impact. It says in the unlined text that US-Russia war in the squo is unlikely, so provides link d

### Biodiversity

#### Their link card literally isn’t about cannabis biodiversity- just biodiversity in general. Their cards DO NOT provide any sort of spillover link

#### Can’t solve for biodiversity outside of marijuana which is the link to all of their impacts. DON’T let them have any offense here.

#### Link turn- more marijuana strains mean that more activists are high rather than actually solving the problems ☺

### Water Scarcity

#### Their cards don’t say that they solve water scarcity, only that they inspire other industries to try to be sustainable

#### Marijuana sustainable is just not a reason why it solves water scarcity!!!!!

#### Turn: Marijuana causes emissions

Davis 8/22 [Melanie David, August 22, 2021. “How The Current Weed Industry Is Bad For The Environment” <https://www.gossipcop.com/how-the-current-weed-industry-is-bad-for-the-environment/2570638/> Accessed 8/22 //gord0]

Cannabis is a plant. Unlike other drugs, it doesn’t come from a lab. Since the ’60s, weed has been associated with earth-loving hippies and pacifists. Yet, despite its natural origins, the weed industry is actually harming the planet. The industry’s carbon footprint is growing rapidly for several reasons. Together, these problems roll up into one huge, complicated joint. So sit back, spark it up and get ready—this one is a doozy. The Environmental Impact Of Cannabis Alone The problem of weed cultivation is a layered one. Its roots stretch into law, agriculture, racial inequity and interstate commerce. First, let’s start with the plant itself. The [Press Democrat reported in 2014](https://www.pressdemocrat.com/article/news/effort-afoot-to-develop-water-use-rules-for-pot-growers/) that the average pot plant consumes up to six gallons of water per day. At this rate, these plants drink enough water to fill 160 Olympic-sized swimming pools over five months. Researchers determined this through satellite images from California’s “Emerald Triangle” (Mendocino, Humboldt and Trinity counties). That’s only three counties in one state. There are 37 other states with supplies of thirsty pot plants. A single adult plant also [emits hundreds of harmful BVOCs](https://pubmed.ncbi.nlm.nih.gov/31498732/https:/pubmed.ncbi.nlm.nih.gov/31498732/) a day. These BVOCs cause the [same type of air pollution](https://scied.ucar.edu/learning-zone/air-quality/ozone-troposphere#:~:text=Tropospheric%20ozone%20is%20formed%20by,occur%20during%20warm%20summer%20months.) as car exhausts and smokestacks. Of course, weed isn’t the only thirsty crop we grow in the United States. One pound of [cannabis requires one gallon](https://www.newsreview.com/sacramento/content/how-much-water-does-cannabis-really-need/17831417/) of water. One pound of [almonds requires 1,900](https://www.paesta.psu.edu/podcast/how-much-water-does-it-really-take-grow-almonds-paesta-podcast-series-episode-43#:~:text=To%20grow%20one%20almond%20requires,high%20demand%20at%20this%20time.). However, we didn’t demonize almonds for 100 years [under racial pretenses](https://www.aclu.org/blog/criminal-law-reform/drug-law-reform/marijuana-legalization-racial-justice-issue). As I said, this issue’s roots run deep. (Legal) Grow Operations’ Carbon Footprint Weed laws differ across state lines. Therefore, we have to consider both legal and illegal grow operations. Both come with their fair share of concerns. [According to Politico](https://www.politico.com/news/2021/08/10/weed-cannabis-legalization-energy-503004), 80% of weed is grown indoors. Indoor growing maximizes plant yield, and the name of the game here is profit. [This California study shows](https://www.researchgate.net/publication/254408509_The_carbon_footprint_of_indoor_Cannabis_production) that indoor facilities use up to 2,000 watts of electricity per square meter. Additionally, it found that producing one kilogram of weed emits 4600kg of carbon dioxide. The [Resource Innovation Institute’s 2020 data](https://www.healtheuropa.eu/a-resource-efficient-cannabis-industry-starts-with-benchmarking/103049/) shows that indoor grow operations have the largest environmental impact. Outdoor growing has the least. Finally, greenhouse operations sit in the middle. They use around 45% of the energy of an indoor site. Switching to LED lights can help increase indoor efficiency. The [Cannabis Reporter cites the EPA](https://thecannabisreporter.com/cannabis-has-a-big-carbon-footprint-heres-how-leds-reduce-it/) as saying, “LEDs offer the potential for cutting general lighting energy use nearly in half by 2030.” But of course, it isn’t as simple as indoor vs. outdoor. Across all locales, Bloomberg Environment estimates that legal cannabis cultivation in the U.S. [consumed 1.1 million megawatt-hours of electricity in 2017](https://news.bloomberglaw.com/environment-and-energy/states-want-pot-to-grow-greener-as-legal-cannabis-expands). That’s enough to power 92,500 homes for a year. Now, the keyword here is “legal.” Bloomberg’s data doesn’t take into account illegal operations. These operations are harder to track, but their environmental impacts aren’t. (Illegal) Grow Operations’ Carbon Footprint The United States [made cannabis illegal in 1937](https://www.britannica.com/story/why-is-marijuana-illegal-in-the-us#:~:text=Aided%20by%20an%20eager%20news,illegal%20across%20the%20United%20States.). 59 years later, California became the first state to legalize cannabis with [Proposition 215](https://ballotpedia.org/California_Proposition_215,_Medical_Marijuana_Initiative_(1996)). However, cannabis didn’t drop off the face of the earth during those 59 years. Illegal grow operations continued throughout cannabis’s prohibition, and they continue today. In Humboldt County, California, law enforcement officers found [14,000 illegal grow sites](https://www.jstor.org/stable/90023267?mag=the-environmental-downside-of-cannabis-cultivation&seq=3#metadata_info_tab_contents) on federal or private lands in 2018. Growers log heavily wooded areas to make room for farms. In doing so, they displace wildlife and use up vital water resources. Weed’s Long-Lasting Effects On Wildlife Illegal operations don’t follow the same environmental standards as legal ones, either. [NPR reported in 2019](https://www.npr.org/2019/11/12/773122043/illegal-pot-grows-in-americas-public-forests-are-poisoning-wildlife-and-water) that many of these “trespass grow” sites use massive quantities of pesticides and other chemicals. These chemicals include Bromethalin, a rat poison, and carbofuran, an [insecticide banned by the EPA in 2009](https://archive.epa.gov/pesticides/reregistration/web/html/carbofuran_noic.html). Ecologist Greta Wengert spoke to NPR at an illegal grow site. During the interview, she points to a tree where she found a gallon of carbofuran. “It is incredibly toxic,” she told NPR. “A quarter-teaspoon could kill a 600-pound black bear. So, just a tiny amount can kill a human. It remains in an ecosystem for a long period of time.” “We have detected [carbofuran] in the soil, cannabis plants, in native vegetation, the water, the infrastructure,” Wengert continues. “You name it, we have detected it. It’s horrible.” Mule deer, gray foxes, coyotes, northern spotted owls and ravens [have also been victims of poisoning](https://www.fs.fed.us/psw/publications/thompson/psw_2017_thompson001.pdf) linked to weed farms. But these poisons affect more than the animals who ingest them. The Pacific fisher, a type of weasel, is [reaching endangered status](https://www.hcn.org/blogs/goat/between-wildfire-and-weed-pacific-fisher-survival-hangs-in-the-balance) at an alarming rate. When fishers ingest the poison, they pass those toxins to their offspring in utero. Salmon, too, are in [danger of extinction](https://www.npr.org/sections/thesalt/2014/01/08/260788863/californias-pot-farms-could-leave-salmon-runs-truly-smoked) due to dwindling water sources.