COUNT THE COSTS
50 YEARS OF THE WAR ON DRUGS

The War on Drugs: Causing Deforestation and Pollution

The global "war on drugs" has been fought for 50 years, without preventing the long-term trend of increasing drug supply and use. Beyond this failure, the UN Office on Drugs and Crime (UNODC) has also identified many serious "negative unintended consequences" of the drug war. These are not consequences of drug use itself, but of an enforcement-led approach that, by its nature, criminalises many users – often the most vulnerable in society – and places organised criminals in control of the trade.

While some of these consequences – such as the creation of crime and the threatening of public health – are relatively well known and understood by those aware of the issue, the war on drugs has produced one casualty which is often overlooked – the environment.

This briefing summarises the environmental costs of the war on drugs, and demonstrates that if these costs are to be minimised or avoided, alternative forms of drug control must be considered.

Although it focuses on the environment, the content of this briefing inevitably overlaps with other areas of the Count the Costs initiative – particularly international development and security, but also human rights, discrimination and stigma, public health, crime and economics. For specific briefings and more resources on these costs, see www.countthecosts.org.

Count the Costs is a collaborative, international project between a range of organisations that, while possessing diverse viewpoints and expertise, all share a desire to assess the unintended costs of the war on drugs, and explore alternatives that might deliver better outcomes

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> *"Spraying the crops just penalizes the farmer and they grow the crops somewhere else ... This is the least effective program ever."*
>
> **Richard Holbrooke**
> US Special Envoy to Afghanistan and Pakistan
> 2002

Introduction

As part of the UN's ongoing commitment to achieving a "drug-free world", international drug policies have, over the past half-century, placed a heavy emphasis on efforts to restrict the production and supply of drugs. Yet it is these supply-side interventions that, while proving utterly futile, are fuelling widespread environmental destruction.

The most direct cause of this destruction is, on the face of it, also the most direct means of disrupting illicit production and supply – drug crop eradication. Usually conducted without consent or forewarning, eradication involves either manually uprooting plants or the aerial spraying of chemical herbicides. Whatever the method used, this practice, directly and indirectly, leaves a catalogue of environmental harms in its wake.

Drug cartels target areas for production that are remote, have little economic infrastructure or governance and suffer from high levels of poverty, so farmers have few alternative means of earning a living outside of the drug trade. In addition to this, these areas include some of the most ecologically rich areas of the world. As a result, drug crop eradication threatens biodiversity, fuels deforestation, and drive illicit crop growers to pursue environmentally hazardous methods of drug production.

Yet despite the environmental toll of this counterdrug strategy, most nations have ratified the relevant international conventions requiring the eradication of certain drug crops. For example, Article 14, paragraph 2 of the 1988 United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances declares that: "*Each Party shall take appropriate measures to prevent illicit cultivation of and to eradicate plants containing narcotic or psychotropic substances, such as opium poppy, coca bush and cannabis plants, cultivated illicitly in its territory.*"

But the same article of this convention also states that: "*The measures adopted shall respect fundamental human rights and shall take due account of traditional licit uses ... as well as the protection of the environment.*"[1]

In practice, however, the environment – along with human rights and traditional uses of drugs – has not been given due consideration in either the war on drugs or the crop eradication campaigns carried out in its name.[2]

The futility of drug crop eradication

Although the logic of illicit crop eradications seems clear, such attempts to break the first link in the chain of the drug trade have been entirely ineffective in generating a sustained reduction in the quantity of drugs being produced. This is because without any significant, prolonged decline in demand, eradication simply increases the price of illicit drug crops: they become a rarer yet equally sought after commodity, which in turn provides a greater incentive to ramp up production.

The lucrative nature of this cycle means that production is never eliminated, only displaced. This is the so-called "balloon effect": production in one region is squeezed by law enforcement, causing it to expand in another region as drug producers mobilise to meet demand (see Figure 1). Despite its continued support for eradication, the UNODC is fully aware of this effect and has highlighted numerous cases where, when eradications cause production to fall in one area, growers in another area pick up the slack.[3], [4], [5]

Given that eradication efforts have so comprehensively failed to deliver their intended outcome, the need to scrutinise their unintended consequences is all the more urgent. From even a cursory examination of the evidence, however, it is clear that one of the most immediate and devastating impacts of drug crop eradications is on the natural environment of some of the world's most ecologically valuable regions.

Two drug markets, two very different sets of consequences

The 1961 UN Single Convention on Narcotic Drugs – the legal foundation of the global war on drugs – has two parallel functions. Alongside establishing a global prohibition of some drugs for non-medical use, it also strictly regulates many of the same drugs for scientific and medical use. In stark contrast to the convention's language describing medical use, the rhetoric on non-medical use frames it as a threat to the "*health and welfare of mankind*", and a "*serious evil*" which the global community must "*combat*", setting the tone for the drug war that has followed.

The convention's parallel functions have also led to parallel markets – one for medical drugs controlled and regulated by the state and UN institutions, the other for non-medical drugs controlled by organised criminals, insurgents, separatists and paramilitaries. There is a striking comparison to be made between the levels of criminality associated with production and supply in these parallel trades. The legal medical opiate market, for example, accounts for around half of global opium production but entails none of the organised crime, violence and environmental damage associated with its illicit twin.

Colombia still allows drug crops to be aerially fumigated with aggressive chemical agents

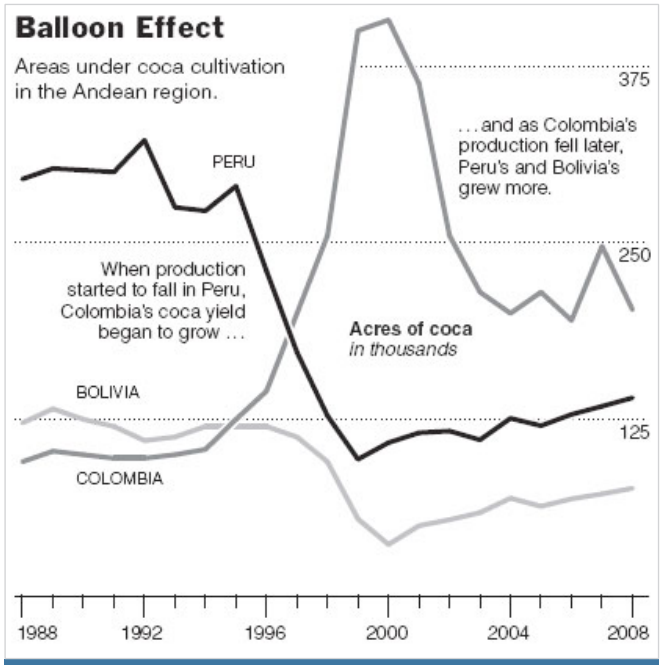

Figure 1: The balloon effect in the Andean region

The Environmental Costs of the War on Drugs

1. How chemical eradications threaten biodiversity

Concerns over human and environmental health have led Peru, Bolivia, Ecuador and Thailand to all ban the use of chemical agents in eradication efforts. But despite these concerns, the world's second most biodiverse country, Colombia, still permits aerial fumigations of drug crops using a chemical mixture primarily consisting of the herbicide glyphosate.

Roundup™: Colombia's 'poison rain'

Produced by Monsanto, the corporation that manufactured Agent Orange during the Vietnam War, Roundup, a commercial glyphosate-based herbicide, is the main component of the mixture used in Colombia's US-funded fumigation programme.

Glyphosate is a non-selective herbicide, meaning any plant exposed to a sufficient amount of the chemical will be killed. In the mixture sprayed in Colombia, the toxicity of glyphosate is enhanced by the inclusion of a surfactant. This additive enables the herbicide to penetrate further through leaves, making it even more lethal to plant life.

Furthermore, the particular surfactant used in Colombia is not approved for use in the US and its ingredients are considered trade secrets,[6] rendering any independent evaluation of its effects all the more difficult to conduct.

The destruction of plant life

The spraying of a herbicide designed to kill flora indiscriminately, across millions of acres of land, is concerning no matter what country it takes place in. But in this case it is especially alarming, given Colombia's approximately 55,000 species of plants, a third of which are unique to the country.

The imprecise nature of fumigation maximises this threat to biodiversity, because rather than being applied directly, from close range (as instructions for the use of herbicides state), these harsh chemicals are sprayed from planes at high altitudes. This increases the likelihood of the wrong field being sprayed due to human error, and in windy conditions causes herbicide to be blown over non-target areas. Consequently, drug crop eradications often wipe out licit crops, forests and many rare plants.

In addition to the short-term loss of vegetation they cause, aerial fumigations can have a more long-lasting impact on plant life. The Amazon has a fragile soil ecosystem, and farmers report that areas which have been repeatedly fumigated are either less productive or yield crops that fail to mature fully.[7]

> *"This spraying campaign [in Colombia] is equivalent to the Agent Orange devastation of Vietnam – a disturbance the wildlife and natural ecosystems have never recovered from."*
>
> **Dr. David Olson**
> Director of Conservation Science, World Wildlife Fund
> 2000

The contamination of national parks

The inadvertent environmental damage caused by chemical eradications is exacerbated by the proximity of a number of Colombia's national parks to illicit coca plantations. In effect, this means that some of the areas most frequently targeted by aerial fumigations are also among the country's most biodiverse and ecologically irreplaceable.[8] As more than 17 million people depend on the fresh water that flows from these protected areas,[9] this undoubtedly represents a threat to human health. It also further threatens Colombia's more than 200 endangered species of amphibians that live in these aquatic environments and are particularly sensitive to herbicides such as Roundup. For example, one study reported that the chemical agent "*can cause extremely high rates of mortality to amphibians that could lead to population declines.*"[10]

The danger to animal health

While the US State Department denies the chemical agents used in Colombia have any severe effects on fauna, evidence suggests that animal health can be seriously impacted by their use. Cattle have lost hair after eating fumigated pastures, and chickens and fish have been killed as a result of drinking water contaminated with the fumigation spray.[11]

More significantly, by eradicating large areas of vegetation, aerial fumigations destroy many animals' habitats, and deprive them of essential food sources. With numerous bird, animal and insect species unique to Colombia, this poses a real risk of triggering extinctions, particularly given the wider pressure on natural habitats in the region.

Such effects are a clear indictment of the decision to fumigate vast areas of a country that has the world's greatest diversity of both terrestrial mammal and bird species, the latter representing 19% of all birds on the planet.

- Although the US Environmental Protection Agency explicitly prohibits the use of glyphosate solutions in or near bodies of water,[12] Roundup is sprayed on tropical forests and cloud forest ecosystems
- In 2002 the Colombian ombudsman received 6,500

complaints alleging that counterdrug spray planes had fumigated food crops, damaged human health and harmed the environment[13]

- Despite the fumigation of approximately 2.6 million acres of land in Colombia between 2000 and 2007,[14] the number of locations used for coca cultivation actually increased during this period, from 12 of the country's departments in 1999 to 23 departments in 2004[15]
- In 2004, 130,000 hectares were fumigated in Colombia, leading to a decrease of 6,000 hectares of coca crops against the previous year. In other words, to eradicate one hectare, it was necessary to fumigate 22,[16] even before taking into account resulting rises in production in other countries

Biological warfare: the looming threat of mycoherbicides

The use of fungi known as mycoherbicides has previously been proposed as a more effective weapon in the fight against illicit crop production. One of the mycoherbicides considered for use is *fusarium oxysporam*, a fungus which produces a toxin harmful enough to be classified as a biological weapon by the draft Verification Protocol to the UN Convention on Biological and Toxin Weapons.[17]

Despite its ability to cause skin diseases and respiratory problems in humans, and despite the obvious risks of introducing novel (in this case genetically engineered) biological pathogens into fragile ecosystems, in 2000 the US lobbied the Colombian government to introduce a strain of *fusarium oxysporam* as part of its drug crop eradication programme. Although this proposal was eventually rejected, a number of Republican members of Congress made subsequent attempts in 2006 and 2007 to "fast-track" research into the fungus so that it could be used for opium eradication in Afghanistan and coca eradication in Colombia.[18] The eagerness with which this drastic measure has been pursued in the past indicates that the use of mycoherbicides in the war on drugs remains a potential environmental threat.

> *"Friends of the Earth Colombia is opposed to the fumigation ... We are also on the alert for a new wave of fumigation using fungus, which could potentially be even more dangerous."*
>
> **Friends of the Earth Colombia**
> 2004

Aerial spraying: the potential human health costs

Despite the US government's claims that the chemical agents used in aerial fumigations pose no significant health risk to humans, conflicting evidence comes from countless reports by local people and a range of academic studies. One of these concluded that the Roundup mixture used in Colombia is toxic to human placental cells and could lead to reproductive problems,[19] while the UN Special Rapporteur on the Right to Health said after a visit to Ecuador in 2007:

"There is credible, reliable evidence that the aerial spraying of glyphosate along the Colombia-Ecuador border damages the physical health of people living in Ecuador. There is also credible, reliable evidence that the aerial spraying damages their mental health."[20]

A skin rash caused by herbicides sprayed from fumigation planes (Photo credit: Sanho Tree)

2. Deforestation

While eradications necessarily cause localised deforestation in the areas in which they are conducted, they also have a multiplier effect, because once an area has been chemically or manually eradicated, drug crop producers simply deforest new areas for cultivation. And in their search for new growing sites, producers move into increasingly remote or secluded locations as a means of evading eradication efforts. Exacerbating the environmental cost of this balloon effect, they therefore often target national parks or other protected, ecologically significant areas where fumigation is banned.

Mexico's Sierra Madre Occidental mountain range, for instance, is one of the most ecologically diverse regions in North America, yet is also one of the most prolific opium and cannabis producing regions in the world. The displacement of drug producers to this area has fuelled widespread deforestation, jeopardising the 200 species of oak tree and the habitats of numerous endemic bird species – such as the thick-billed parrot – that are found in the region.

Such deforestation is not limited to the area cultivated for illicit crops. Rather, in addition to this land, producers also clear forest for subsistence crops, cattle pastures, housing, transport routes and in some cases for airstrips. As a result of this, several acres of forest are often clear-cut to produce just one acre of drug crop.

- In 2008 the UN reported that, for the fourth consecutive year, the Alto Huallaga region of Peru – which is located in tropical and subtropical forests – was the country's largest coca cultivating area[21]
- The growing of opium poppy in countries such as Thailand and Myanmar depletes thin forest soils and their nutrients so quickly that slash-and-burn growers, after harvesting as few as two or three crop cycles, clear new forest plots. The cumulative effect of this has compounded the environmental destruction taking place in the Golden Triangle region[22]
- Significant areas of US national parks in California, Texas and Arkansas have been taken over by Mexican drug cartels growing cannabis[23]

Drug war enforcement measures are driving drug crop producers to seek out new, more secluded land in ecologically valuable rainforests (Photo credit: Taran Rampersad)

> *"This destruction of the rainforest for coca production and coca plantation has gone on under the radar of the environmentalists. We hope that this will be a wake-up call. We hope that the World Wildlife Fund and Greenpeace will start saying 'what is this?'"*
>
> **Francisco Santos Calderón**
> Vice-President of Colombia
> 2008

The Andean region: bearing the brunt of drug war deforestation

The countries that make up the South American Andes region are among the most ecologically precious in the world, containing thousands of endemic species of plants, hundreds of endemic species of mammals, birds, fish, reptiles and amphibians, and countless endemic insect species. But it is these countries, vital though they are to global biodiversity, that are most impacted by the deforestation which stems from the war on drugs.

Although reliable data on rates of deforestation as a result of illicit drug production are hard to produce, the following statistics have been put forward by drug law enforcement agencies or public officials:

- In Colombia, at least 60% of illicit crops are grown on newly deforested land[24]
- In 2000 the Colombian Minister of Environment suggested a million hectares of native forests had been eliminated as a result of the cultivation of drug crops[25]
- Between 2003 and 2004, coca cultivation within Bolivia's national parks increased by 71%, from 2,400 to 4,100 hectares[26]
- According to the US Drug Tsar, 10% of Peru's total rainforest destruction over the past century is due to the illicit drug trade[27]

> *"Every year ... jungle [cocaine] laboratories send more than 20 million liters of toxins into the nearby tributaries that feed the Amazon and Orinoco rivers. Affected waterways are almost entirely devoid of many species of aquatic plant and animal life."*
>
> **John Walters**
> US Drug Tsar
> 2002

3. Pollution from unregulated, illicit drug production methods

The war on drugs hands responsibility for the production of potentially dangerous substances over to unscrupulous criminal profiteers. This has many negative consequences, not least creating a threat to public health and fuelling violent conflict. But there are also environmental consequences of an unregulated, underground system of drug production. Because of the illegality of their operations, drug producers must dispose of the chemicals used in the manufacture of their goods secretively, which in many cases means pouring toxic chemical waste into waterways or onto the ground. This leads to soil degradation, destruction of vegetation, contamination of water sources and loss of aquatic life.

The production of methamphetamine is notorious for the environmental harm it causes. This is due to the number of dangerous chemicals used in the manufacture of the drug, which the US Drug Enforcement Administration puts at twelve.[28] These include sulphuric acid, ether, toluene, anhydrous ammonia and acetone. As a result, the production of one kilo of methamphetamine can yield five or six kilos of toxic waste, which is sometimes dumped directly into water wells, contaminating domestic water and farm irrigation systems in the US.[29]

However, the environmental consequences of improper chemical disposal are all the more pronounced in South American countries, where this waste is deposited in the jungles and forests used by drug producers to hide their operations from law enforcement and eradication attempts.

- In Colombia, cocaine producers discard more than 370,000 tons of chemicals into the environment every year[30]
- Thousands of tons of chemical waste are dumped into the rivers located in the Peruvian Amazon region annually[31]

Energy up in smoke: the carbon footprint of indoor cannabis production

An additional and perhaps unexpected environmental cost of the war on drugs is the vast amount of electricity consumed by indoor cannabis farms. The necessarily covert nature of their operations means that producers cannot grow the drug outdoors with the aid of natural light. Instead, they are driven by current drug policies to use exceptionally energy-intensive indoor growing facilities.

A report from a staff scientist at the Lawrence Berkeley National Laboratory[32] estimated that these indoor facilities, with lighting 500 times more intense than that needed for reading, account for 1% of the US's total electricity consumption. In California, the top producer state in the country, indoor cultivation is thought to be responsible for 3% of all electricity use. This corresponds to the amount of electricity consumed by one million average California homes, or greenhouse gas emissions equal to those from one million average cars. According to the report, such levels of energy consumption mean that a single cannabis joint represents two pounds of CO_2 emissions, equivalent to running a 100-watt light bulb for 17 hours.

A coca processing "lab" in Colombia. The toxic chemicals used in the production of illicit drugs are often dumped into jungles, natural water sources or forests (Photo credit: Sanho Tree)

The Maya Biosphere Reserve: Guatemala's mini narco-state

The Maya Biosphere Reserve is the largest protected area in Central America, spanning a fifth of Guatemala and encompassing four national parks. Once home to the ancient Mayan civilisation, the reserve now houses diverse ecosystems and many endangered species. But this diversity is increasingly being threatened.

Drug traffickers have effectively taken control of protected areas in Guatemala (Photo credit: 'jugrote')

In recent years drug cartels have created large cattle ranches within the reserve in order to launder their profits and conceal key trafficking hubs, some of which include aircraft landing strips. As they encroach on this protected land, the traffickers cause significant environmental damage: the ash from the fires they start to clear fields leads to acid rain; soil erosion results from deforestation; and many rare animal species – including jaguars, river turtles and monkeys – lose their habitats.

According to Claudia Samayoa, director of Udefegua, a human rights advocacy group in Guatemala:

"The narcos use violence and poverty as tools to push into the reserve ... They cultivate land, put in some cattle, but often it's just a front."[33]

The governor of Guatemala's Péten region has also drawn attention to the need to protect the reserve, stating that:

"Organized crime and drug traffickers have usurped large swaths of protected land amid a vacuum left by the state, and are creating de facto ranching areas. We must get rid of them to really have conservation."[34]

Are there benefits?

The main claim for any environmental benefit of the current enforcement-led approach to drugs is that it minimises the ecological damage caused by illicit drug production methods. As this briefing has outlined, it is certainly true that drug production has a heavy environmental cost; and it is this cost, it is argued, that would be far greater were it not for harsh eradication programmes and punitive law enforcement measures that prevent drug producers from expanding their operations.

But this claim, frequently made by the US State Department and others, reveals a wilful blindness to the evidence. Intense fumigation and manual eradication programmes have not reduced the environmental harms that result from unregulated drug production. If anything, they have simply *transferred* these harms to more remote, ecologically sensitive areas such as the Amazon forests – an unavoidable consequence of the balloon effect.

Contrary to the assertions of law enforcement officials, it is drug-war policies themselves that are compounding the environmental devastation which ensues from illicit drug production techniques. Current drug control measures are no such thing: without proper regulatory oversight, left in the hands of unscrupulous criminals, drug production will continue to be conducted covertly, leading to the dangerous disposal of chemical waste, and damage to sensitive and important ecosystems.

How to Count the Costs?

Environmental impact assessments should be conducted to establish the effects of past and future eradication programmes on non-target flora and fauna. The social, economic and health impacts of eradication efforts on humans should also be assessed. This must include a rigorous monitoring system to investigate complaints from farmers and local populations.

More generally, environmental concerns must be taken into account in the planning, implementation and, crucially, the evaluation of programmes and policies at national level. Similarly, international funding of any measure must pass through environmental scrutiny, and the UNODC should adopt environmental guidelines for country teams.

Finally, the environmental impacts of current drug policies should be assessed alongside a range of alternative systems – including decriminalisation of personal possession of drugs, and models of legal regulation – to provide guidance on the best ways forward.

> *"[The decline in tobacco use] was handled pretty well by cultural change ... There were no police. Nobody carried out chemical warfare in North Carolina and Kentucky to destroy tobacco fields. It was simply an educational process."*
>
> **Noam Chomsky**
> Social activist and Professor of Linguistics, Massachusetts Institute of Technology
> 2009

Current drug policies must be comprehensively evaluated in order to minimise their environmental impact (Photo credit: Chris Gray)

Conclusions

The environment is under threat in a variety of ways, from a variety of sources – including the illicit drug trade. But what is clear, reflecting on the experience of the past 50 years, is that the war on drugs has been wholly counterproductive in its attempts to stem the environmental harms caused by this trade.

That it is the drug war itself, and the criminal market it creates, which exacerbates and spreads these harms – most frequently across ecologically rich and fragile regions – is all too apparent. None of the harms outlined in this briefing occur in the legal production of coca, opium or cannabis for medicinal or other legitimate uses. It is also clear that, for the forseeable future, poverty and inequality in producing regions mean there will be no shortage of farmers willing to grow drug crops.

The environment is always a casualty of war. But the war on drugs is a policy choice. There are other options, such as decriminalisation and legal regulation that, at the very least, should be debated and explored using the best possible evidence and analysis.

We all share the same goals – a safer, healthier and more just world. It is time for all sectors affected by our approach to drugs, and particularly those concerned with the environment, to call on governments and the UN to properly *Count the Costs of the War on Drugs and explore the alternatives.*

> *"The drug war has tried in vain to keep cocaine out of people's noses, but could result instead in scorching the lungs of the earth."*
>
> **Sanho Tree**
> Director of the Drug Policy Project
> at the Institute for Policy Studies
> 2009

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For more information, including on how you can get involved, visit: www.countthecosts.org or email info@countthecosts.org

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