



Caught in the middle, Colombia's war on drugs and its effects on forest and people

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ABSTRACT

Coca plantations are the largest illegal agribusiness in the world, and Colombia is the world's leading coca producer. Since 1994, the Colombian state, with the aid of the US, has waged a war on drugs based on air fumigation of coca plantations. This article evaluates the social and environmental impacts of this policy. We construct and analyse statistically for the first time a spatial database with social, economic, environmental, coca production and fumigation data for all 1125 municipalities of Colombia for the period 2001–2008. We complement statistical analysis with in situ observations and secondary literature review. We find that even if the questionable government claims that overall extent of coca plantations has been reduced were to be true, still coca activity has been diffused in the territory, with devastating environmental and social consequences. Biodiversity hotspot areas are being deforested, and local populations, especially Afro-Colombian communities, are being displaced from their territories. Our statistical analysis provides quantitative evidence to back up previous claims based on victims' experience, single case-studies and ethnographic observation. We question the effectiveness of the fumigation policy and suggest that what is actually eradicated by the war on drugs is not coca, but humans and the forest.

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1. Introduction

Coca production is the largest illegal agribusiness in the world. The global cocaine retail value is estimated at US\$80–\$100 billions, equivalent to 0.15% of global GDP, and at the level of the annual GDP of countries such as Iraq or Slovakia (UNODC, 2010). Cocaine, consumed mostly in North America and Europe, is primarily produced in the Andean region. The plantation of coca crops for cocaine is concentrated in three countries: Colombia, Peru and Bolivia. Since 1997, Colombia is the main coca producer, accounting for more than 50% of total world production, with some 81,000 ha of coca cultivated and 450 metric tons of cocaine produced in 2008. Coca production in Colombia accounted for 623 millions of dollars of revenue in 2008, 0.3% of GDP and 3% of agriculture's GDP (UNODC, 2008a). Unlike Peru and Bolivia, whose anti-drug policy is based on manual eradication, Colombia is the only country in the world to use aerial fumigation.

Colombia's fumigation policy began cautiously in the end of the 1970s in order to fight marijuana plantations, but was extended in 1994 to the expanding cultivations of coca. Aerial fumigation intensified and proliferated with the signing of 'Plan Colombia' in 1999 by Colombia and USA and the subsequent creation of the "Program of Eradication of Illicit Crops with Glyphosate" in 2000.

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Plan Colombia has been celebrated as a great success in reducing the total area of the country occupied by coca from 144,800 ha in 2001 to 81,000 ha in 2008 (UNODC, 2010), presumably liberating local populations from the grip of the illegal business and its devastating consequences. The Colombian government has also heralded the environmental benefits of the war on drugs; the coarse hypothesis behind such statements is that coca has negative environmental effects and any policy that reduces must by definition have positive ones (Álvarez, 2007; Bernal, 2007). Yet, other researchers argue that fumigation goes hand-in-hand with deforestation and environmental degradation (Ávila et al., 2007; Vargas, 2004; Walsh et al., 2008a), negative health effects (Ávila et al., 2007; IDEA, 2005; Nivia, 2001a), and social impacts, including forced displacement, disproportionately falling on Afro-Colombian groups and low-income population (Defensoría del Pueblo, 2007; OAI, 2010).

How does aerial fumigation affect coca production, the livelihood and settlement patterns of human populations and the state of ecosystems? This is an important question if one wants to know how and why anti-drug interventions "from a safe distance", such as aerial fumigation, may produce counterproductive results at the ground that undermine their proclaimed intentions. We provide new evidence at a finer spatial scale than ever before, which substantiates the claim that aerial fumigation has negative social and environmental effects, and we then explain why this is the case. We argue that the aerial fumigation policy is ill-suited for the socio-environmental interdependencies present at the complex

socio-ecosystem of the Colombian forests, where most of coca production is concentrated. In this, we position our research as a case study of the broader thesis about the failure of State improvement schemes based on schematic visions that do violence to complex socio-ecosystem interdependencies (Norgaard, 1994; Scott, 1998).

We are not the first ones to study the social and ecological impacts of cocaine production or the war on drugs. There is a long literature on the failures of the US-driven war on drugs in Latin America and particularly the negative effects of the forced displacement of cultivations (Guáqueta, 2005), compared to more structural solutions offering employment alternatives to producers (Guridi, 2002). The failure of forced policies to make peasants to leave cocaine production has been documented for the case of Bolivia (Guridi, 2002) and Peru (Cabieses, 1999). A grand part of the literature on aerial fumigation evaluates direct impacts, most notably on health (e.g. Ávila et al., 2007; Hewitt et al., 2009; IDEA, 2005; Nivia, 2001a; Solomon et al., 2005a, 2005b), and the environment and agriculture (Ávila et al., 2007; Eslava et al., 2007; Messina and Delamater, 2006; Nivia, 2001a, 2001b; Varona et al., 2009). Concerning indirect effects, there are studies, which have looked at the displacement of peasants and legal crops in Bolivia and Peru (Bradley and Millington, 2008). For Colombia there is anecdotal evidence that the fumigations destroy the revenue base of the peasant economy and displace both coca production and peasants to new areas (Vargas, 2004). Scrutinizing the official data at the national level, González (2006) finds inconsistencies that raise questions about the proclaimed effectiveness of the eradication policy. Also an inter-temporal econometric analysis at the national level by Moreno-Sanchez et al. (2003) shows that the cultivation area of coca in Colombia has increased as eradication efforts have intensified, because farmers compensate for eradication by cultivating the crop more extensively. This pattern is confirmed by a statistical analysis at the level of the 32 sub-national departments of Colombia by Dion and Russler (2008), who find that fumigation displaces, but does not eradicate, coca production. This displacement effect has been called in the drugs literature the “balloon effect” (Laffiteau, 2010; UNODC, 2008b) and attributed to an inelastic demand, that will be satisfied in one way or the other by the producing regions.

Whereas this literature offers many useful reference and entry points, there are several gaps if one wants to get a more accurate picture of how aerial fumigations affect production, settlement and ecological patterns in Colombia. First, the national or regional scale analyses hide important shifts and effects at lower spatial scales, where complex interdependencies are at play. We provide here for the first time data coverage on fumigations and coca cultivation down to the municipal level (1125 municipalities). Second, much of the interest until now has been on production patterns, and the effects of fumigation on the acreage and location of coca cultivations. Despite claims for the dislocation of people or the uneven impacts of the policy on the basis of race or class, no other study to our knowledge has examined such effects rigorously. We cover a greater number of variables per year (also for a more recent period, 2001–2008, than other studies) identifying new associations between coca cultivation and its social impacts, especially dislocation, which has not been evaluated before. Third, concerning environmental impacts, whereas Dávalos et al. (2011) before us also looked at the complex relations between illicit crops and deforestation in Colombia at the municipal level, we extend his analysis by using a different methodology on the basis of a mapping of ecosystems which permitted us to evaluate land-use changes at the ecosystem level (see methods below). Fourth, and most importantly, this is the first study that attempts an integrated and multi-dimensional analysis of both direct and indirect effects of fumigations at the most refined scale possible. Whereas other studies before focused either on health, environmental or produc-

tion effects, we examine all these together. This gives us the opportunity to offer a more accurate understanding of the multi-faceted effects of fumigation on people and the territory, and through it draw wider claims on how improvement schemes and anti-drug policies from a distance produce negative effects in complex socio-ecosystems such as those of Colombia.

In summary, our main claim is that the fumigation policy is failing in Colombia, because it does not eradicate, but diffuses coca production, shifting it to forests of ecological importance and to areas inhabited by low-income, especially Afro-Colombian and indigenous communities, which as a result are increasingly displaced. The broader significance of our claim is the confirmation of a broader pattern whereby government “improvement” policies imagined from a distance fail miserably in the face of complex local socio-ecological interdependencies.

Section 2 presents the methods used to generate the evidence for this claim and the new data mobilized or constructed for this analysis. We employ a novel spatial approach to respond to the above questions demonstrating the importance and contribution of geographical analysis. In particular, we analyze statistically a newly-compiled geographical and longitudinal dataset of aerial fumigation, coca production and various socio-economic and demographic variables at the municipal level, complementing it with qualitative information from interviews and secondary documents, as well as in situ assessments of the impacts of aerial fumigation.

Section 3 presents the empirical evidence that supports our claim. We find that:

1. Fumigation has not eradicated, but displaced coca production to other regions. Such a “Balloon effect” has been noted by others for manual eradication and at the macro-regional level (Bradley and Millington, 2008; Laffiteau, 2010; *The Economist*, 2001; UNODC, 2008a). Our intra-national study finds in addition that aerial fumigation not only displaces, but actually diffuses the production of coca in the territory, and that the effect of fumigation is temporary, as production often returns after a while. This creates a negative spiral of fumigation and cultivation that affects more and more territories and people.
2. Fumigation in Colombia displaces production to areas of primary forest of great environmental significance.
3. Fumigation causes negative health impacts but these are contested and hard to verify. The level of complaints launched by local communities suggests that fumigations do impact negatively local livelihoods.
4. Fumigation is associated with increased human displacement.
5. Less developed communities, including indigenous and Afro-Colombian communities, are disproportionately impacted by fumigation and coca displacement. There is no evidence however to suggest discriminatory fumigation by the authorities.

Section 4 discusses the main findings of our research and attempts to explain why is the policy failing. We argue that the policy overlooks complex interdependencies at the local level, and in particular does not account for the lack of alternative sources of income, as well as the particular socio-ecological features of the coca economy, which make it selectively shift to areas of primary forest and low development. Section 5 reinstates our main conclusion and draws its policy implications: the Colombian anti-drugs policy of aerial fumigation has caused a displacement and diffusion of coca cultivation in the territory, impacting socially and ecologically vulnerable areas and expanding the war on drugs to new areas, affecting the livelihoods of more people. We add our voice to those who argue that the US and Colombian governments should reconsider thus policy and shift resources instead to policies that curb demand for drugs at its source or that

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