

# Chemical warfare in Colombia, evidentiary ecologies and *senti-actuando* practices of justice

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[journals.sagepub.com/home/sss](http://journals.sagepub.com/home/sss)**Kristina Lyons**

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**Abstract**

Between 1994 and 2015, militarized aerial fumigation was a central component of US-Colombia antidrug policy. Crop duster planes sprayed a concentrated formula of Monsanto's herbicide, glyphosate, over illicit crops, and also forests, soils, pastures, livestock, watersheds, subsistence food and human bodies. Given that a national peace agreement was signed in 2016 between FARC-EP guerrillas and the state to end Colombia's over five decades of war, certain government officials are quick to proclaim aerial fumigation of glyphosate an issue of the past. Rural communities, however, file *quejas* (complaints or grievances) seeking compensation from the state for the ongoing effects of the destruction of their licit agro-forestry. At the interfaces of feminist science and technology studies and anthropology, this article examines how evidentiary claims are mobilized when war deeply politicizes and moralizes technoscientific knowledge production. By ethnographically tracking the grievances filed by small farmers, I reveal the extent to which evidence circulating in zones of war – tree seedlings, subsistence crops, GPS coordinates and bureaucratic documents – retains (or not) the imprints of violence and toxicity. Given the systematic rejection of compensation claims, farmers engage in everyday material practices that attempt to transform chemically degraded ecologies. These everyday actualizations of justice exist both alongside and outside contestation over the geopolitically backed violence of state law. Rather than simply contrasting everyday acts of justice with denunciatory claims made against the state, farmers' reparative practices produce an evidentiary ecology that holds the state accountable while also '*senti-actuando*' (feel-acting) alternative forms of justice.

**Keywords**

aerial fumigation, evidentiary ecologies, socioecological justice, war on drugs in Colombia

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In 2000, the year the US-Colombia antidrug policy Plan Colombia commenced, the southwestern frontier state of Putumayo produced over forty percent of the country's illicit coca cultivations (UNODC, 2005). The region quickly converted into the epicenter of militarized aerial fumigation and forced manual eradication interventions. As its name suggests, the Program for the Eradication of Illicit Crops by Aerial Aspersion with the Herbicide Glyphosate (PECIG) consisted in crop duster planes spraying a formula of Monsanto's herbicide, glyphosate, over suspected illicit coca, marijuana and opium poppy crops, without distinguishing between plantation and small landholding sized cultivations. PECIG criminalized rural communities, ignoring the structural conditions that lead individuals and families to engage in illicit economic activities. The mixture of glyphosate utilized in aerial spraying is estimated to have been 110 percent more concentrated than Monsanto's commercially available weed-killing version, Roundup Ultra. Glyphosate is a broad-spectrum, non-selective herbicide absorbed by the leaves of a plant, slowly killing it by inhibiting the production of essential amino acids. The herbicide was also mixed with two surfactants, polyethoxylated tallow amine (POEA) and Cosmo Flux 411F, to enhance its activity and make it stick to plants in a humid tropical climate (Vargas Meza, 1999). More than 1.8 million hectares of coca have been aerially fumigated with glyphosate in Colombia since 1994, and 282,075 hectares in the state of Putumayo since 1997.<sup>1</sup> The volatile nature of aerial aspersion as a chemical application method – erratic climatic factors, plane velocity and distance from the ground, size of the chemical molecules and rate of dispersion, possible guerrilla attacks, and human and technological error – caused forests, soils, pastures, livestock, watersheds, subsistence food, and human bodies to be regularly misted with the formula of glyphosate. While human rights, environmental NGOs, policy watch groups, concerned scientists and rural communities long opposed aerial aspersion, calling it 'chemical warfare', the US and Colombian governments consistently defended the policy, arguing that the herbicidal cocktail kills illicit crops, but poses no scientifically proven harm to other bodies and ecologies. After years of controversy, a resolution (0006) to suspend aerial aspersion with glyphosate was finally issued by the Colombian government on May 29, 2015. This came in the wake of a report published by the World Health Organization's cancer research arm (IARC), reclassifying the world's most widely used herbicide under the category 2a – a *probable* carcinogen to humans.<sup>2</sup> It was not until October 1, 2015 that Colombia's National Environmental Licensing Agency (ANLA) officially suspended the license to use glyphosate in aerial spraying. Between May and October coca-growing regions were repeatedly fumigated as the antinarcotics police attempted to use the millions of dollars' worth of glyphosate already purchased from Monsanto.

In the midst of a protracted and ongoing 'science war' over the toxicity of glyphosate, this article is part of a research project that examines how evidentiary claims are mobilized when war overtly politicizes and deeply moralizes technoscientific knowledge production. My research involved ethnographically tracking the *quejas* (complaints or grievances) filed by small farmers in Putumayo who claim that their farms were wrongfully fumigated and who seek compensation from the state for the destruction of their licit agroforestry. This article focuses specifically on the extent to which kinds of evidence circulating in environmentally complex zones of war – tree seedlings, subsistence crops, GPS coordinates, maps and bureaucratic documents – retain (or not) the

imprints of violence and toxicity. Given that a peace agreement was signed in 2016 between the national government and the largest and longest-standing leftist guerrilla organization in the Western hemisphere, the Revolutionary Armed Forces of Colombia (FARC-EP), to end more than fifty years of war – the country's second largest guerrilla group, the National Liberation Army, is still negotiating a peace process – certain state entities have been quick to proclaim aerial fumigation an issue of the past. Within the country's ongoing post-conflict – or what others call post-accord – and transitional justice scenario, the systematic rejection of rural communities' compensation claims demands questioning. Particularly, as public debates surrounding truth and reconciliation come to include 'nature' as a casualty of war, attempts to construct a viable and sustainable peace with and from the country's diverse territories entails a rethinking of how to situate histories of violence and the potential for reparative or restitutive acts. My ethnographic approach at the interfaces of feminist science and technology studies (STS) and anthropology takes seriously the everyday material practices in which farmers engage as they attempt to repair and transform chemically degraded ecologies. Staying attentive to these material practices and their situated temporalities highlights the everyday and more-than-human actualizations of justice that exist alongside and outside contestation over the geopolitically backed violence of state law.

The first two sections of the article situate the reader in the rural life worlds that have been repeatedly aerially fumigated in the Andean-Amazonian foothills of Colombia. I first introduce the case of Pedro Pablo Mutumbajoy, a protagonist in the article, who connected me to the seventy other compensation claims in Putumayo that I ethnographically follow. I then turn to conversations on the relationship between justice, temporality and materiality, and introduce the concept of evidentiary ecologies as an alternative form of evidence-making under conditions of military duress. The second section discusses the variations of justice emerging among rural communities. I carefully track Pedro Pablo's case, and then discuss the seventy other grievances filed in his municipality to examine the structural mechanisms that lead to the systematic denial of compensation claims. I go on to explore the reparative and transformative practices in which farmers alternatively engage to restore chemically degraded agroforestry ecologies, as well as their conceptualizations of these practices. The article concludes by arguing that, rather than simply contrasting everyday acts of justice with official state compensatory processes, farmers' reparative practices produce an evidentiary ecology that upholds accountability for multiple trajectories of violence while also *senti-actuando* (feel-acting) alternative forms of justice.

### **Justice in the time(s) of 'post-glyphosate'**

As we walked through a reforested area of Pedro Pablo Mutumbajoy's farm in March 2015, we stopped to admire a pair of large mint-green butterflies that were almost camouflaged against a patch of lichen inhabiting the bark of a nearby tree. Pedro remarked that these butterflies never appeared during the almost fifteen years when his family dedicated the surrounding fourteen hectares of land to growing monoculture coca. His family was not unlike many others that settled in the rural municipality of Puerto Guzmán, Putumayo since the late 1950s, when they found themselves obliged to migrate or were forcibly

displaced to the Andean-Amazonian foothills due to political violence, land concentration, and economic precarity in the agricultural interior of the country (c.f. Cancimancel, 2015). Puerto Guzmán was administratively demarcated as a municipality in 1992. It is located 54 kilometers from Mocoa, Putumayo's capital, and is accessible by an unpaved roadway bordered by the curvaceous shores and seasonal floods of the powerful Caquetá River. In 2006, after their coca, subsistence crops and farm animals were aerially fumigated three times, and the cost of production to grow coca markedly increased, Pedro's family decided to uproot their coca plants. This left twenty-five workers unemployed and left his widowed elderly mother to sustain the family on stevia, an agricultural project promoted by the mayor's office. The stevia quickly became fodder for the family's pigs, given that there was no viable market.<sup>3</sup> In the end, they let much of the farm sit still to be reclaimed by *rastrojo* (initial regrowth forest), and after five years they began to plant native timber-yielding varieties among the naturally regenerating trees. Pedro Pablo took the presence of the butterflies to indicate that some kind of 'enmienda' (remedy or setting right) was taking place – a gradual recuperation of diverse vegetation, soils, insects, microbial life, watershed areas and, he hopes, one day the family's economy. For now, Pedro supports his five children and granddaughter as a part time laborer on a neighbor's forestry plantation and through piecemeal jobs and agricultural work.

I began fieldwork in the Andean-Amazonian foothills and plains in 2004, at the height of renewed critiques of Plan Colombia. My initial trip to Putumayo was with foreign policy watch and human rights organizations, and over the past thirteen years I have engaged in research and accompanied agrarian movements and popular processes throughout the region. I had not been invited to Pedro's farm to simply rejoice in its ecological resilience, but rather to witness the way the emergent reforestation project had been violently interrupted almost two years earlier. A fourth round of aerial fumigation hit Pedro's now coca-less farm on September 16, 2013, killing approximately 350 cultivated *simarouba amara* (*tara*), *vochysia vismifolia* (*arenillo*), *jacaranda copaia* (*canalete*), *ocotea oblonga* (*amarillo*), and *couma macrocarpa* (*perillo*) trees, among other flora, and of course forest inhabitants, such as the butterflies we witnessed that morning. The fumigated trees remained leafless. Their white branches splayed out like bony fingers. Skeletons of trees entangled with the living vegetation that had not been misted with an indeterminate herbicidal agent. Pedro told me that he left the trees standing as evidence. Toxic imprints in the ecology; the traces of what was – is becoming forest (Figure 1). When I later returned to the images of these skeletal remains of trees, I was reminded of what I came to think of as an evidentiary landscape produced by a similar wood. In 2007, while visiting farms further south in what is known as the sub-region of Bajo Putumayo, I observed a large wooden cross standing solemnly beneath the glaring brightness of the equatorial sun. The cross was erected in the middle of an overgrown field to mark the presence of a mass grave that could not be disclosed to local authorities, given the ongoing nature of war and state complicity in paramilitary violence. The field is located behind a house that right-wing paramilitaries, the United Self-Defense Forces of Colombia (AUC), used as a torture center between 1998 and 2006, when they occupied the urban centers of Bajo Putumayo, and disputed with the FARC and narco-traffickers for control over territory and the cocaine trade.<sup>4</sup> Despite the official demobilization of the AUC in 2006, mid-level commanders and combatants



**Figure 1.** Aerial view of Pedro Pablo's fumigated silviculture in El Trébol, Puerto Guzmán. Photo by Jorge Luis Guzmán and Simón Uribe.

reorganized into countrywide narco-criminal structures, such as Los Rastrojos, Los Urabeños, and Los Constructores. The Colombian government now refers to these groups as *bacrim* (emergent criminal bands), or more recently after the peace signing with the FARC-EP, as 'post-demobilization armed groups' (see Barbosa and Ciro, 2017).

Within a context of ongoing impunity and violence, certain farmers, such as Pedro, who claim to have been wrongfully fumigated, file *quejas* (complaints or grievances) seeking compensation from the state for the destruction of their licit crops – mostly plantains, yucca, corn, sugarcane, cacao, pasture grass, fruit trees and silvicultural arrangements. Killed domesticated animals, for example, are not eligible for compensation because the state investigation process takes longer than the time for a carcass – the evidence – to rot. The Complaint Direction of the Antinarcotics Police (DIRAN) receives and processes these *quejas*, which converts the agency into both *juez y parte*. DIRAN operated the fumigations, is responsible for investigating, and issues administrative rulings over the grievances filed against these same operations.<sup>5</sup>

How are evidentiary claims mobilized in criminalized ecologies when war deeply politicizes and moralizes technoscientific knowledge production? To what extent do these ecologies retain and transform the imprints of violence and toxicity? When state-mediated forms of justice become unlikely or impossible, how might justice be imagined and actualized through everyday material practices? What is the relationship between justice, temporality and materiality in struggles to cultivate sustainable presents and futures under conditions of socioenvironmental conflict and military duress? STS has long revealed that the technoscientific is political, and the controversy surrounding aerial fumigation of glyphosate in Colombia demonstrates par excellence the cycles of mutual reinforcement between contested scientific discourses, corporate seed/chemical/pharmaceutical giants, and militarized geopolitical interventions. The threat of narco-terrorism legitimated the suspension of law and the precautionary principle, as well as the pervasive criminalization and surveillance that conforms to illicit crop monitoring and



eradication-based antidrug policy. Feminist scholars working in STS have paid particular attention to the mechanisms that render chemical exposure imperceptible or nonexistent (Fortun, 2001; Murphy, 2006, 2008; Schrader, 2010), the epistemological baggage that accompanies the concept of 'evidence' (Andrews, 2015), and what comes to count, for whom and how (Nelson, 2015).

Social movements, leftist political organizations and popular processes in Colombia argue that peace depends upon more than demobilization and the end to armed conflict, and must necessarily guarantee *una paz sostenible con justicia social desde y para los territorios* [a sustainable peace with social justice (collectively determined) by and from the territories]. Issues of justice – how, when and for whom – necessarily include the shared, albeit asymmetrically distributed impacts of aerial spraying among crop-dusted human bodies and agro-forestry ecologies. Direct and indirect causalities of war in Colombia have increasingly come to include what some call 'nature' and the socioecological relationalities that constitute a given territory, both of which may have been ruptured or severely reconfigured by multiple layers and temporalities of violence. Violence is not only understood in the context of the armed conflict and its entanglements with the US-financed War on Drugs, but more broadly in terms of the modes of dispossession and degradation that both facilitate and result from capitalist economic development. Environmental movements, civil society organizations and ethnically diverse rural communities argue that war (including forced displacement and the usurping of land, among less conventionally recognized modes of dispossession) has enabled the expansion of a neoliberal national development model that voraciously appropriates more and more forms of life as extractible 'resources' (Lyons, 2016a; see Asoquimbo, 2016; Censat Agua Viva, 2016; Programa de Naciones Unidas para el Desarrollo [PNUD], 2014; Wilches-Chaux, 2012). There is also increasing concern that territories that were largely impenetrable during times of war due to the presence of armed groups, and hence relatively conserved, will now be open to economic development and the destruction wrought by intensified growth-oriented, extractivist development.

Farmers such as Pedro Pablo negotiate their ethical aspirations between seeking punctual, future-oriented legal redress from the state, and the everyday, open-ended labor required to carry on living with and from a poisoned farm. When the search for legal restitution becomes systematically frustrated or rendered impossible, how might certain reparative practices enact an evidentiary ecology that simultaneously holds state and corporate complicity accountable while also re-composing 'past' harms enacted by a myriad of actors? Thinking in the presence of the skeletal remains of trees, reforested coca fields, wooden crosses and the reappearance of butterflies may offer a response to Tsing's (2014: 93) call for us to create a vocabulary for livable disturbance – that is, to consider how varied trajectories of disturbance are made ecologically viable for some (but never all) forms of life. As Tsing explains, this is not meant to justify environmental destruction, nor, I add, to transcend the impossibility of achieving integral reparatory justice. Instead, it might provide a first step in coming to terms with the unevenly distributed condition of having to not only carry on with but also processually transform chemically degraded life. Rather than simply contrasting everyday ecological-based reparative acts with demands for legal accountability on the part of the state, an attention to both kinds of material practices and their corresponding temporalities and affects may



**Figure 2.** Defoliated forest and burnt fields resulting from aerial spraying with glyphosate in the municipality of Valle de Guaméz, Putumayo. Photo by author.

elucidate the dynamic and not-only-human actualizations of justice at stake in the aftermath of decades of chemical warfare (Figure 2).

### **Justice, temporality and materiality**

In her work on the petrochemical history of the St. Clair River, Murphy (2013) introduces the temporal concept of ‘latency’ to think about how the submerged chemicals of the past become reactivated in the present to disrupt the reproduction of the latter (p. 3). ‘Through latency’, she writes, ‘the future is already altered’. Similarly, rural communities in Putumayo articulate their experiences of aerial spraying in its brute immediacy and complex reverberating series of toxic effects. The crop-dusted past may manifest itself in the present through absence: in the abandoned farmhouses of families that could no longer withstand repeated aerial assaults against their livelihoods, or in pastures emptied of animals after their lethal poisoning. It may persist in the intricate biochemical matrices of soils while they regain a minimal semblance of their former health. Or irreversibly alter life in intergenerational time after debts are accrued when the harvests that were intended to provide a family’s economic sustenance were abruptly destroyed by spray drift. Entire ecologies may exist in an unknown temporal extension that Jain (2007) calls ‘living in prognosis’. Pedro Pablo describes it as the haunting possibility of strange illnesses appearing in human bodies, bodies of water, crops and forests in five, eight, or ten years, and the previously unseen afflictions that now plague his rural neighbors. Future illness is statistically probable although the correlational toxicological pathways back to exposure to glyphosate are rendered less evident.<sup>6</sup> In a similar vein, Barad (2010) alerts us that ‘the world “holds” the memory of all traces; or rather, the world *is* its memory’ (p. 26). Barad’s materialist reading of Derrida’s formulation of justice is one in which justice is conceived of as forever an open project, an aspirational orientation.<sup>7</sup> Both Murphy and Barad pose generative questions regarding the ethico-political obligations and possibilities of reworking the sedimented material effects of the past, and hence the present and the future.

In step with these possibilities, the presence of the skeletal remains of trees and the reappearance of butterflies on Pedro Pablo's emergent silviculture (formerly monoculture coca) farm is striking. Not only because they provide evidence of the layers of violence and transformative potential enfolded into fumigated ecologies, but also because they remind us of the limits of a commitment to justice that is solely concerned with changing social power, institutional representation and denouncing the prejudices of the state. Political theorists in Latin America and elsewhere have reoriented our attention away from state-centric models for social change precisely because they may lead us to overlook diverse potentialities existing in the present (Gutiérrez, 2006; Zibechi, 2007) and the everyday material practices that creatively contribute to socioecological transformation. Nishnaabeg scholar Simpson (2011) and Papadopoulos et al. (2008) warn that these everyday material practices have been obfuscated by twentieth-century political thinking's fixation on quintessential oppositional events (i.e. revolts, strikes, revolutions, political elections and built-up social movements and organizations), which are rarely present-centered, generally becoming designated as events in retrospect or anticipated as future possibilities. Without ignoring collective human actors, macro-level power relations or the conventional key events of political economy, an attention to emergent, everyday material practices leads us to consider the delicate balance and qualitative difference between what Hage (2012) characterizes as oppositional politics and alternative practices. Crudely put, this speaks to the necessary balance between politics aimed at contesting, resisting, and/or defeating an existing order – the 'anti' – and the practices in the present aimed at providing alternative material conditions to this very order – the 'alter'.

Alongside legally contested compensation claims and histories of collective mobilization and rural protest, I was led to ask how farmers' everyday practices of ecological repair enact multiple, even incommensurable, variations of justice: In particular, how the opened relations I observed between fumigated coca fields, trees, butterflies and farmers in Puerto Guzmán – among other plant, animal, soil and forest life – actualizes an everyday transformative politics that aims to slowly repair glyphosate-exposed conditions of existence. Simultaneously, these relations produce what I call 'evidentiary ecologies' that cannot help but retain the traces of violence enacted against them, and hence signal specific accountabilities in the face of ongoing impunity, even as contaminated life is re-composed. Evidentiary ecologies may be an alternative form of making and registering evidence when one is unable to meet the structurally asymmetric demands of state-based knowledge production, and when faced with the limits to the science of toxicology in its application in complex environments – which may also be under military duress. Chemically altered life harbors the memories and material residues of harm wrought against it within the same wounds from which reparative acts may also germinate. In their 'ground truthing' capacities (Weizman, 2017), evidentiary ecologies register not only what is present, but also subtle traces of past damages, some of which have been actively erased. Thus, these chemical modes of violence are likely compounded by multilayered trajectories of violence that continue to impact and threaten the ongoing possibility for life. More than solely becoming a mode of registering accountability in contexts of shameless impunity, these ecologies actualize aspirational processes of justice-making in efforts to repair ruptured territorial relations, relations in which there are no easily identifiable culprits or absolutely innocent and safe positionalities. The concept of evidentiary ecologies highlights the way



landscapes not only passively harbor evidentiary material in their damaged or ‘victimized’ states, but also the other-than-human participation and relational underpinnings involved in the re-construction of environmental memory and reparative acts.

As Pedro Pablo explained,

My work on the farm is a kind of social and environmental justice, in contrast to the justice of the state that fumigates us without considering our *sentir* [what we feel]. Of course, it would be fair for the state to recognize the damages it caused us. Government entities talk about the environment, but they are the first to violate the rights of the living beings that grow where they spray. My relationship with the forest has changed ... it is still changing. We have become aware that we also mistreated the soils, trees and water sources. We are entering into another logic not to destroy, but instead to recover.

Pedro Pablo’s conceptualization of the reforestation of his farm as an alternative transformative justice-seeking process can be placed in conversation with a broader territorial ‘turn’ – or better yet, opening – that is emerging among agrarian movements throughout the hemisphere (Svampa, 2015). These movements are accompanying historical demands for land and the right to property with a broader defense of life and territory. This territorial opening has led a growing number of peasant communities to conceive of and organize their farms as not only economically productive spaces, but also connective places with ethical obligations to a myriad of socioecological continuums: Farms as watersheds, foothills, *selva*, seed guardian networks, wild animal habitats and ecological corridors. Pedro Pablo’s practices resonate with Papadopoulos’s discussion of the ordinary materiality of existence as the space where non-deferred and unmediated actualizations of justice can emerge. Inspired by Benjamin’s divine *Gewalt* as that which dismantles the very possibility of law as the deferral of justice, as well as the reappropriation of urban space that occurred during metropolitan strikes in Western Europe, Mexico, Tunisia and Egypt over the past decade, Papadopoulos (2012) writes,

The more justice happens just now, the more ‘worlded’ it is. It breaks with the violence of the eternal cyclical struggle between constituent and constituted power and starts from the very fact that it restores justice for those who suffer injustice just now. When justice is ordinary and present ... it is a justice without intermediaries and without diplomats, referees, experts, translators. (p. 19)

Papadopoulos argues that this immediate ‘worlding’ of justice is a form of leftist posthumanism that evolves out of the long tradition of the left by escaping its future-oriented obsessions with capturing social power, and by decentering the modern humanist political subject. I am interested in practices of ‘worlding’ that do not assume its relegation to the agentive capacity of a radical or organized ‘left’. I am also hesitant to altogether dismiss people’s attempts to contest the law of the state or to seek normative modes of corrective power.

Pedro Pablo and other farmers I met in Puerto Guzmán instruct us about the variations of justice that emerge along with *el sentir* (feeling) and enacting or making life within the particular ecological conditions of a chemically degraded landscape. Feeling-acting, or what I refer to as *senti-actuar*, affectively impules a transformation of questions of justice

as an everyday material practice. It does so alongside and beyond regulation through the temporalities of bureaucratic mechanisms, political recognition and self-professed radical ideology. Building on the concept of worlding, feeling-acting emphasizes the affective components that occur within shared, albeit asymmetrical, ecological conditions in which human livelihoods form both a reparative and contaminative part. These affective elements inspire and compel actors to transform the worlds that many of them have also participated in degrading. In a historical conjuncture where the end to war has become a viable possibility, farmers are constructing peace by ethically responding to and taking responsibility for extractive relations with and in their territories. They are affectively moved to transform their agricultural practices and modes of inhabiting the territory by connecting their own hardships and struggles to a broader set of ecological harms that may be aggravated by continued socioenvironmental conflicts during official times of peace.

Ecologies on the mend hold the evidentiary traces of the violences committed against them, and are maintained as evidence because reparations are always precarious and partial acts. *Senti-actuar* is in a conceptual dialogue with what Escobar (2014) calls the need to *sentipensar* or feel-think with the land and the diverse practices of local communities, rather than prioritizing ‘expert knowledges’ as the protagonists in the transformation of a given territory.<sup>8</sup> Conceptually, *senti-actuar* emphasizes the connection between thinking and feeling, and also the actions that one might take as a result, the creative imaginings and practices that one might come to engage in. Notions of ‘worlding’ and *senti-actuando* may help to elucidate the complementary links between what Gudynas (2014) distinguishes as an environmental justice that remains centered on the redistribution of ‘resources’ and ‘natural spaces’ between humans, and a more expansive concept of ecological justice that encompasses world-sustaining relations and the interdependencies of diverse forms of life (p. 178). My intention is not to dismiss the struggles and advances of self-proclaimed leftist political organizations in Putumayo (see Mesa Regional de Organizaciones Sociales del Putumayo, Baja Bota Cauca y Cofanía – Jardines de Sucumbíos, 2015). Neither do I aim to inadvertently buttress the US and Colombian governments’ criminalizing binary between lawful versus wrongful fumigation. There is no singular mode of political engagement nor, I add, single temporal register to actualizing justice in degraded ecologies that, as of yet, exist under the threat of chemical-based eradication policy. When farmers attempt to hold the state accountable through the only existing bureaucratic mechanism, aspirations for justice-seeking and making are never only this. We must also ask for whom, how and when reparative socio-ecological transformation comes to matter (Figure 3).

## Variations of justice in criminalized ecologies

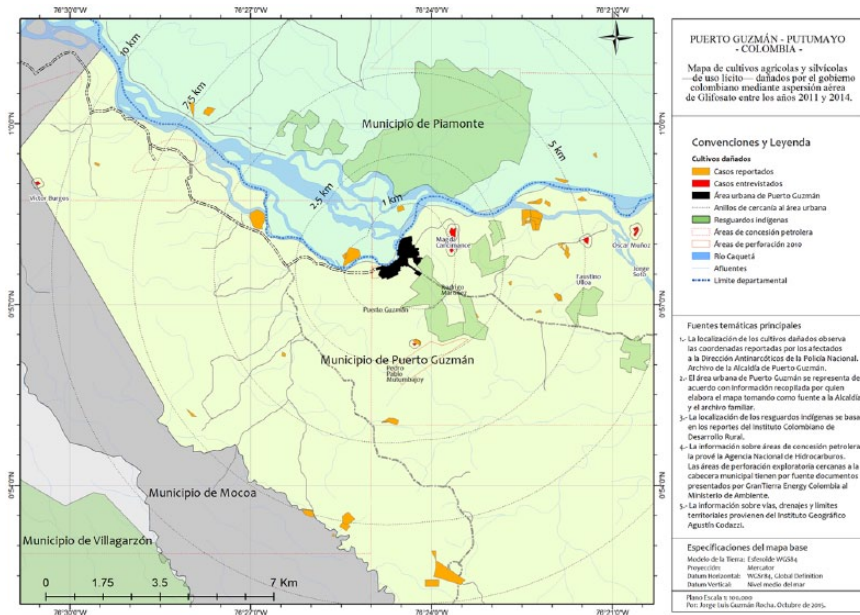
A 2001 resolution (00017) passed by Colombia’s National Council on Narcotics provides a standardized bureaucratic mechanism to process *quejas* regarding the destruction of licit agroforestry crops during aerial fumigation. Individuals filing claims must prove that: 1) they do/did not have illicit crops growing on their property or land holding, and 2) the damage to their licit agroforestry was definitely caused by PECIG. This requires temporal, spatial and scalar synchronization between dates, hours, GPS coordinates, crop duster flight plans, illicit-crop monitoring maps and visibly recognizable in-situ



**Figure 3.** Subsistence plantains destroyed by exposure to glyphosate after aerial fumigation operations in San Miguel, Putumayo. Photo by author.

destroyed crops. In March 2015, I visited Puerto Guzmán’s municipal legal office, which functions as the intermediary between the antinarcotics police (DIRAN) and individuals filing complaints, to find that 70 *quejas* had been reported since 2011. The municipality does not have a record of any cases filed before this date. I was initially prompted to visit the legal office after learning that Pedro Pablo’s compensation claim for the damage to his silviculture was denied, and that due process had been violated. Of the 2,265 complaints filed in the department of Putumayo since DIRAN began processing them in 2001, 93.5 percent have been rejected. This reflects similar tendencies at the national level where 17,643 complaints have been filed and 96 percent denied.<sup>9</sup>

With a friend, Jorge Luis, who is trained in information technology and whose father arrived in the region in 1958 and is said to be the founding settler of what later became named after him as the municipality of Puerto Guzmán, we set off to georeference these 70 cases and to track their investigations and final rulings. I then selected seven cases that reflect the range of reasons for which compensation claims are systematically denied. I visited the families involved to learn about their experiences of aerial spraying and their everyday agricultural practices, and to walk with them through the fumigated agroforestry ecologies they call home (Figure 4). The geographic coordinates Jorge Luis aided me in mapping are those registered on the complaint forms, since the presence of the FARC at the time throughout the *veredas* [rural settlements] of Puerto Guzmán made recording new coordinates a thorny endeavor. Of the thirteen municipalities in Putumayo, Puerto Guzmán is said to have had the longest sustained guerrilla activity on the part of the FARC-EP – the 32nd front of the FARC occupied its urban center between 1982 and 2002 until the first police and military incursions into the municipality. Puerto Guzmán is also the only coca-growing hub in Putumayo where the AUC was unable to enter and take control over the town center, after citizens armed themselves and expelled the paramilitaries (Cancimancel, 2014).



**Figure 4.** Georeferenced map of licit agro-forestry crops reported to have been damaged by aerial spraying between 2011 and 2014 in Puerto Guzmán. The areas in yellow correspond to the locations of the reported cases, while red marks the cases where farm visits were conducted. Green demarcates indigenous reservations while black indicates the town center of Puerto Guzmán. Solid and dotted red lines delimit oil concessions and areas where oil is actively being exploited. Our map reveals that the officially established 100 meter safe spray or buffer distance from rivers, roadways, special protection zones, and areas densely populated by humans and animals was repeatedly violated by fumigation operations during this period. Source: Jorge Luis Guzmán.

When I visited Pedro Pablo's farm, he explained that he submitted his initial *queja* to the municipal legal office on October 5, 2013, within the thirty calendar days post-fumigation allotted for individuals to file a grievance. This required that he gather the following *probatorios* [evidence]: The title for his property or land holding, the correct GPS coordinates for the area presumably affected by aspersión, the exact time and date when the fumigation occurred, a description of the kind of agriculture realized on the property, the estimated economic value for the damage to perennial crops (start-up investment and the value of the single harvest lost according to current market prices in the region), and transitory crops (the value of the single harvest lost according to current market prices), as well as photographic evidence of the purported damage. When the DIRAN office in Bogotá, Colombia's capital, would have received this documentation five business days later, they would have reviewed flight plans to verify that an aerial fumigation operation occurred at the corresponding GPS coordinates at the time and date reported by the claimant. Pedro Pablo received notification from the DIRAN on November 6th that his claim had been admitted, meaning that the police had corroborated that his farm had been sprayed. Twenty-two days later he received a letter informing him that his case had entered a *periodo de pruebas*

[period of proof] in which a group of technicians would visit his farm, and from a helicopter verify the presence of the purported damaged licit crops and the absence of illicit coca. This inter-institutional technical group, comprised of the Ministries of the Environment and Justice, DIRAN, and the Colombian Agricultural Institute, never touches the ground and never has any direct contact with the claimants. Like most of the families I interviewed, Pedro Pablo never knew when or if the verification had occurred. In March, five months after submitting his *queja*, the municipal legal office notified Pedro Pablo that DIRAN's final ruling had arrived: Compensation denied. The administrative order stated that he had no such agroforestry crops growing on his property – his silviculture and tree seedbeds were actively not seen – and that instead, the technical team observed the presence of illicit coca, although they had no obligation to provide evidence of this alleged fact. Pedro Pablo was either a trickster or an outright liar, and in either case, a criminal actor fumigated according to the law. The 165.5 million pesos of damage (\$54,147 USD) to his silviculture project – the value of the trees in twenty years as calculated by the municipal secretary of agriculture – was simply said not to exist.

When we walked around Pedro Pablo's silvicultural project in March 2015, we spotted a tiny coca plant sprouting from the dense underbrush of the regenerating tropical forest. He wondered aloud how, after fifteen years of growing monoculture coca, he could have avoided a coca seed or two being dispersed by bird excrement or otherwise resurge – part of a past that is inevitably present in the ecological relations of the present and future forests. DIRAN, he said, lacked the political disposition to differentiate between spontaneous seedlings and a cultivated plantation of illicit crops, or to acknowledge his family's economic transition, with all the associated work to recover the soils and forest that they too had participated in damaging, from commercial monoculture coca.

Pedro Pablo had five business days to appeal DIRAN's ruling and he did so through the municipal legal office. By June he had not received a response and so filed a right of petition. A week later, DIRAN replied that his appeal was inadmissible because it had arrived two days late (a difference between five and seven business days). Administrative ruling: Appeal denied. After some investigation, we realized that there had been two institutional errors. First, the municipal office stamped the wrong date (one day early) to record when Pedro Pablo received DIRAN's original ruling. Second, DIRAN counted a Monday holiday as a workday, thus incorrectly adding two extra days to the procedural time. If his claim had been awarded, he would have received a phone call requesting that he travel by land to Pasto, the capital of the neighboring Andean department of Nariño, to receive his compensation. This sixteen hour round trip costs a minimum of 200 thousand pesos (\$60 USD), and requires traversing a roadway, popularly known as *el trampolín de la muerte* [the trampoline of death], connecting the Andean foothills to the Amazonian plains (see Uribe, 2013). A farmer who made this journey to Pasto told me that when he disputed the meager compensation he was offered, which did not even cover his transportation and lodging costs, state officials replied: 'Either accept the money or file a lawsuit that can take between one and eight years to be resolved'.

### *Systematic negation and the untimely*

The seventy cases I reviewed in Puerto Guzmán were rejected for a similar set of reasons. (1) The individuals did not file complaints within stipulated bureaucratic time





**Figure 5.** Don Victor demonstrates how he perched on a tree stump and waved at the pilot of the approaching crop duster plane to alert that he was about to fumigate black pepper and not illicit coca in August 2014. This pepper was originally funded by a USAID crop substitution project. Photo by author.

frameworks. Many rural communities learned of the existence of a grievance mechanism long after they were aerially fumigated. Furthermore, the distant and expensive travel to reach municipal capitals – sometimes nine hours up and down rivers, additional hours on horse or mule, or by foot, and the impossibility of travel when communities were confined by armed actors, all complicate access to state institutions. Municipal employees, for example, told me how they often relied on radio announcements to haphazardly communicate with people who live in remote areas with no cellular phone reception. (2) Complainants were said to provide incomplete GPS coordinates for their property, or ones that do not match the coordinates of DIRAN’s fumigation logs. Another farmer Pedro Pablo and I visited, Don Victor, explained that his compensation claim was denied when DIRAN argued that his property, located in San Pedro Guadalupe on the Puerto Guzmán side of the municipal limit with neighbouring Mocoa, is actually located in the municipality of Mocoa. Don Victor was repeatedly told that he did not know where he lived, and that he needed to file his complaint in Mocoa (Figure 5). I found hand-drawn maps in the municipal archive, from when rural families were unable to locate GPS technology, as well as people’s letters explaining that the FARC would not permit GPS coordinates or other photographic evidence to be recorded. They petitioned for exemptions from these requirements. DIRAN generally classified these cases as ‘desisted’. (3) The exact time and date of the reported fumigation did not coincide with police logs. For example, Doña Magda was displaced to the town center of Puerto Guzmán when the FARC employed a new security measure in 2002 that prohibited anyone, including her school-aged children, from commuting between town and rural *vereda* after the municipal incursion of military and police forces. She relied on

neighbors for details about the 2014 fumigation of five hectares of her family's yucca, plantain, and corn crops. Her *queja* was denied when she attempted to correct the date (five days off) that she initially submitted on the complaint form. (4) DIRAN resolved that there was no causal relation between aerial fumigation and the purported destruction of licit crops, due to the registered spray distance. A no-spray safety and buffer distance of 50 to 120 meters was established by a Canadian toxicologist and adopted by PECIG's environmental monitoring plan.<sup>10</sup> For example, Oscar showed me the remains of two hectares of plantain trees that were fumigated in August 2014. Oscar's claim was denied for lack of causality even though his neighbor paradoxically received compensation (a meager \$150 USD) for damage to his plantains, which resulted from the spray drift caused by direct crop-dusting of Oscar's farm. (5) Claimants were accused of growing illicit coca mixed with their licit agriculture, or in Pedro Pablo's case, his 'non-existent' silviculture.

Farmers in Puerto Guzmán had disparate motivations for filing complaints. For some, it was the hope of the non-repetition of aerial spraying. For others, it was a political stance against systematic persecution and criminalization; given that they aspire to render an ongoing injustice public, many claimants requested that I use their real names in this article. Most people hoped to receive a compensatory payment despite acknowledging the incalculability and complex nature of their losses – imprints present in not only putrescent crops and enduring economic hardship, but also wooden crosses marking specific sites of brute violence and continuing impunity. Disputes over claims, among other inconsistencies, have revolved around mismatching temporal registers, political indisposition, and essentialist logics that are systematically biased against the socioeconomic and infrastructural conditions of rural communities residing in the country's transitioning 'post-conflict' zones. What counts as evidence for or against exposure to glyphosate has been built into an investigatory apparatus that generates opacity and arbitrariness. The state technical team verifying complaints has treated the fumigation as an isolable event with a margin of error that may or may not have produced 'collateral damage' – reduced to a specific day, a precise hour, claims to environmental monitoring and, in rare cases, the recognized loss of a single harvest.<sup>11</sup> There is no institutional mechanism to render legible chemical alterations in human or animal bodies or in the complex life cycles of plants-soils-forests. For example, soil scientists at Colombia's National Geographic Institute Agustín Codazzi (IGAC) conducted the environmental monitoring of the residue of glyphosate in fumigated soils. When I visited the National Soil Science Laboratory of the IGAC, a chemist explained that the different metabolic rates determining the soil's breakdown of chemical compounds would require almost daily testing in environments where confounding variables cannot be controlled.<sup>12</sup> Thus, no generalizable limit for permissible quantities of glyphosate in soils' complex biochemical matrix can be established. While farmers were regularly deemed to run out of or exceed bureaucratic time, DIRAN tended to extend the investigative process over months before pronouncing a ruling.<sup>13</sup> What other kinds of practices may be reworking the residual effects of glyphosate while the bureaucratic time of waiting for the (im)possibility of state-based justice ticks on?

### Residues and transformative reparations in evidentiary ecologies

We want to live in peace. We are working to stop the deforestation, to care for the water, to reforest and to protect the watersheds. We are trying to *enmendar* [remedy] what we ourselves also damaged. And look what the government does to us? Burnt trees, burnt soils ... (Don Rodrigo Martínez, Puerto Guzmán, Putumayo, April 2016)

Pedro Pablo Mutumbajoy's farm is located in what used to be a 'gallery forest', which formed as corridors along the high wetlands of the basin of the Mandur River, a tributary of the Caquetá River. Gallery forested ecologies are otherwise sparsely treed, because many tree varieties cannot subsist in humid and seasonally flooded riparian conditions. *Virola calophylla* (*sangretoro*) and *platymiscium pinnatum* (*granadillo*) trees formerly populated these shores until they were replaced by a mix of monoculture coca plantations, extensive pasture for cattle grazing and gold mining. The disappearance of gallery forests implies the loss of plants adapted to moist microclimates, biological corridors for all kinds of terrestrial life, water conservation capacities, and non-timber forest and riverstuff used by rural communities. According to Colombia's Institute of Hydrology, Meteorology, and Environmental Studies, the municipality of Puerto Guzmán currently registers one of the highest rates of deforestation in the Colombian Amazon (IDEAM, 2015). Pedro Pablo explained that his soils had 'crystalized', eventually turning hard and dry due to exposure to open sunlight after the forest was felled and his recurrent use of agrichemicals. Soil degradation was then aggravated by the government's persistent aerial aspersion with glyphosate. Similarly, the Mandur River is now contaminated and choked in many places by the residual polluting effects of coca, aerial fumigation, cattle ranching, gold mining and oil spills – over the previous decades, multinational extractive activities intensified and pipelines were converted into guerrilla targets. Approximately 45 percent of the municipal territory has been reserved by the state to develop further oil exploitation (Corpoamazonia, 2008). When Pedro Pablo began to reforest his farm, five years passed in which *rastrojo* (initial regrowth forest) reclaimed the deforested fields. He went on to plant native trees that could endure the abrasive conditions of recovering soils. Later, shrubs and bushes were sown to provide additional shade and, finally, native timber-yielding varieties were planted, whose seeds would be dispersed along with the forest's emergent successional cycles. Some life was occupying the farm for the first time (Figure 6). Other vegetation and trees attempted to return as *rastrojo* transitioned into nascent secondary forest. There was, of course, no regenerating the gallery forest that had been or the unknown earlier successions that had made that forest and the ones before.

When Jorge Luis and I visited another former coca farmer, Don Rodrigo, in a neighboring *vereda*, his farm stood out as a forested refuge floating amidst an open sea of pasture grass. It felt as if at any moment the sliver of trees would be swallowed up, overwhelmed by the homogenizing force of the adjoining cattle-occupied landscape. Hiking there was arduous because of the severe compaction of trampled soils. The surrounding pastures were converted into mud pits that trapped both human boots and the hooves of calves. Don Rodrigo's coca-less farm was fumigated in August 2014, damaging his silvopastoral arrangement. He had introduced *dalis* and *panameño* grasses and diverse timber-yielding and non-timber trees and shrubs, such as *gólgota*, *corocoro*, *simarouba amara* (*tara*),



**Figure 6.** Butterflies inhabiting Pedro Pablo's reforestation project in El Trébol, Puerto Guzmán. Photo by author.

*vilex masoniana verbenacea* (barbasco grillo), *cedrela odorata* (cedro), *calycophyllum spruceanum* (capirón), and *bilibiles*. The aerial spraying also killed a pool of domesticated *cachama* and *bocachico* fish. Don Rodrigo's compensation claim was denied when technicians from the regional office of the Ministry of Environment (Corpoamazonia) recorded the wrong GPS coordinates for his land holding. He refused to receive DIRAN's negative administrative ruling, and left the unsigned document to be archived in the municipal legal office. As we walked around the farm, he jokingly told us that he could not even 'trabajar con las uñas' [scrape by using the nails of his fingers] because he has no hands. Gesturing with his elbow, he pointed to the now defoliated trees that hauntingly and stubbornly remain after the aerial fumigations, and that he had planted with the intention of shading his cows from the direct heat of the tropical sun. He had rigged a hosing system to fertilize the farm's glyphosate exposed soils using the manure produced by three voluptuous pigs. Ironically, Don Rodrigo's land was likely aerially fumigated because the shrub, *morera*, he planted to diversify what would have otherwise been uniform pasture grass resembled a coca bush from pilot's-eye view. Resolute to remain on the farm even though his son had joined the military and his wife, worn down by years of war, had left the region, he told us that when resources allowed he would continue to reforest and diversify his pastures. Reforesting, he said, creates a cooler microclimate for the animals, and recovers tired soils and the nearby dried brooks and streams of the Mandur

watershed. He hoped that his persistence might inspire some of his neighbors to begin to transition to *silvipastoril* practices. Pedro Pablo also told us that if he had the financial resources he would sow another hectare of trees the following year.

These brief stories are not ones of clear-cut innocence or triumphant heroism, much less ones where justice(s) have been realized. One could easily resist an argument regarding the alternative imaginaries and enactments of justice that they harbor. Neither Pedro Pablo nor Don Rodrigo position themselves or their emergent reparative ecological practices outside regional histories of environmental degradation, economic precariousness and social and armed conflict. They are protagonists shaped by and continually shaping the cycles of deforestation and reforestation, constrained decisions, economic foreclosures, chemical alterations and the transformative possibilities of resurgent forests, soils and river basins.

No guarantees exist in these spaces of tentative ecological repair. Crop duster planes have poisoned and negated the existence of a forest's recomposing. Poisoned animals remain unacknowledged and quietly decomposed into the landscape, and the consequences of glyphosate exposure on human health remain uncertain. Hardly anyone can meet the evidentiary burdens of state-based knowledge production, and they find themselves exposed to the violence of an externally mediated judgment that never brings compensatory justice. In addition, the continued manual application of glyphosate or other chemical substances in counternarcotic operations remains an imminent threat, the mass graves left behind in the wake of paramilitary violence remain a kind of 'public secret' (Taussig, 1999), and the environmental impacts of oil spills caused by FARC explosives and infrastructural failures largely remain unresolved. Unlike the Paraguayan peasants in Hetherington's (2011) ethnographic account, these farmers do not attempt to further penetrate the recesses of state bureaucracies to dispute their social exclusion, but rather have begun to enact justice in their everyday material and affective relations on and beyond the farm. They seek to construct peace by making peace with and from their territories in ways that resonate with what Das (2007, 2015) has conceptualized as modes of ethical living that descend into the wounded folds of everyday life.

When Pedro Pablo stands beside two *simarouba amara* (*tara*) trees that he planted on the same day to demonstrate the stunted growth of the one hit by glyphosate spray drift, he retains this dead seedling for its ability to produce a kind of evidentiary ecology that holds the geopolitically-backed violence of state law and corporate complicity accountable – yet it does not only do this. The tentative recovery of forest composed of the skeletal remains of trees and the reappearance of butterflies actualizes a form of justice that does not defer it to a future moment determined by intermediaries of the state. Instead, ecological asymmetries are dealt with by reworking the sedimented chemical-based degradations of the past that is also the here and now by taking responsibility for one's participation in diverse modes of degradation, and by creating both subtle and more conspicuous landscape markers to signal and remember violently extinguished life. Aspirations for justice are not linear, but perhaps more akin to a forest's successional temporalities. Seeking and making justice is violently interrupted, lives on, becomes frustrated, resurges, cycles around to open up and foreclose spaces, creating conditions for the return of some forms of life and not others as farmers *senti-actuar* modes of ecological repair. When Pedro Pablo and Don Rodrigo engage in everyday reparative practices that attempt to transform the material substances of their chemically altered farms,



these practices exist both alongside and outside state-based claims for compensatory justice. Furthermore, they do so without necessarily becoming part of an organized or self-identified 'left', given the complex localized dynamics of war that have historically troubled stable demarcations between left-right-state-paralegal armed actors. There is no singular narrative that explains why certain farmers who have been victims of chemical warfare also take responsibility for the chemical contamination of local ecosystems, and begin to relate and act differently towards the soils, forests, rivers and watersheds that sustain and are sustained by their livelihoods.

## Conclusion

It seems strange to write a conclusion to an article about the open-ended and aspirational orientations of justice. It is especially strange given that a transitional justice phase in Colombia only recently commenced, and that the use of glyphosate in antidrug policy has not been altogether suspended. As of now, Colombia is the only country in the world to implement aerial fumigation as counternarcotic strategy. Suspension of the use of glyphosate in aerial spraying raises important questions and new and old concerns about the future of the global war on drugs. These questions lie at the heart of Colombia's national peace process and post-conflict scenario. What will a democratic reformulation of antidrug policy look like? Can it be tightly coupled with long-awaited agrarian reform, democratic openings and guarantees for political participation? What forms will reparations for victims take, including the casualties of war referred to as what we may call 'nature', 'natural resources', and the 'environment'?

Putumayo continues to produce around twenty percent of the nation's illicit coca crop, and the region is slated to become an experimental focal point of post-conflict, transitional justice programs and further alternative development initiatives. This includes the government's shift towards 'integral' antidrug approaches that replace discourses of criminality with ones of vulnerability. However, vulnerability may be what Stengers and Pignarre (2011) call an 'infernal alternative' that continues to treat coca growers and disputed rural territories as objects of intervention rather than protagonists – in the most reductionist political sense, as a perpetual problem to be solved.<sup>14</sup> Farmers' variant practices of seeking and making justice in Putumayo, and the popular insistence that peace with social justice must be collectively determined *from* and *not for* the territories that have been epicenters of war, warns against any singular conception of justice that rains down like glyphosate from centralized government and geopolitically-dictated mandates and visions.

In this article, I have tried to hold in tension farmers' demands to seek compensatory justice with the everyday labor required to carry on within chemically degraded conditions, as well as the non-deferred and not-only human actualizations of justice enacted in practices of ecological repair – practices that require no need for verification, periods of proof and external rulings. When waiting for state-based justice becomes untenable, due to extreme structural violence, everyday relational practices may *sentí-actuar* alternative conditions for material existence in the midst of glyphosate-exposed worlds. Ongoing repair does not pretend to erase the subtle and more conspicuous ecological imprints of enfolded layers of violence and impunity. Nor does it become a redemptive solution for

chemical crimes against the region's human and nonhuman inhabitants or rural communities' roles in deforestation and the degradation of local soils and watersheds due to structural conditions, including the historical lack of agro-ecologically appropriate technical assistance. However humbly and tentatively, farmers' emergent forestry practices encompass not only anthropocentric concerns for the redistribution of 'resources' and 'natural spaces', but also the ecological relations and temporalities of which their human livelihoods form a reparative and contaminative part. These practices *senti-actuar* variations of justice by making evidentiary ecologies that uphold the accountability of various violent actors, structures and harmful socioecological engagements – they cannot do otherwise. Chemically exposed ecologies retain the imprints of toxicity while they processually transform, inhabiting the time of now with actualizations of sustainable presents and futures: in the successional cycles of resurging gallery forests, transitioning rural economies, the slow recovery of polluted watersheds and farmers' shifting territorial relations, affects and everyday material attempts of repair.

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### Notes

1. The Antinarcotics Directorate of the National Police provided these official statistics on August 18, 2015. Since the late 1970s, forced eradication strategies in Colombia have utilized chemical warfare tactics, including the application of paraquat, Garlon 4, Imazapyr, and Tebuthiuron. For a comprehensive historical memory of the origins of aerial fumigation policy in Colombia, see Moreno (2015).
2. Glyphosate joins earlier herbicides and insecticides, such as dioxin (an ingredient in Agent Orange) and dichlorodiphenyltrichloroethane (DDT), which were widely employed by the burgeoning US military-industrial complex and later expanded into civilian life as commercial products. In both cases, the cumulative contaminating effects of these chemicals were insistently denied until the scientific community revealed their 'potential' cancer hazard to humans. See also Agard-Jones's (2015) work tracking bodily exposure to chlordécone in Martinique.
3. Elsewhere, I have elucidated the militarized supply-side drug interdiction focus of Plan Colombia, the policy's nexus with the US military-industrial complex, and the general failure

of USAID crop substitution programs and state-implemented alternative development projects to provide viable socio-economic alternatives to illicit coca cultivation (Lyons, 2016b; see also Ramírez, 2005).

4. Putumayo has been an important territorial base for the FARC-EP since 1984. The 32nd front first occupied the department, and after doubling its numbers later established the 48th front (Ramírez, 2001). With roots in the 1980s, the AUC grew to about twenty thousand members, and was heavily financed through the drug trade, the country's traditional land owning, cattle ranching, and political class, and multinational corporations. At least 506 members of the AUC belonging to the Bloque Sur Putumayo occupied the Putumayo between 1998 and 2006.
5. A growing number of rural communities are eager to pursue group action lawsuits against the state, after learning that the Colombian government agreed to pay the neighboring government of Ecuador 15 million dollars in a legal settlement in 2013. Ecuador sued Colombia for the cumulative environmental and public health impacts caused by the aerial spraying of the border region between the countries. However, the Colombian government referred to this payment as an 'economic contribution' rather than compensation for damages. People in Ecuadorian communities living near the border say they have seen no evidence that this settlement money was invested in the territory. Interviews with community members from the border province of Sucumbios, Ecuador were conducted between July 4–6, 2015 at the National Constitutional Assembly of Coca, Poppy, and Marijuana Growers in Mocoa, Putumayo.
6. A study published by Camacho and Mejía (2015) demonstrates that exposure to the herbicide used in aerial spraying increases the number of medical consultations related to dermatological and respiratory-related illness and the number of reported miscarriages. See also Red por una América Latina Libre de Transgénicos (2015).
7. I am also indebted to Vaisman's (2017) inspired reading of Derrida.
8. Escobar builds on the work of Fals Borda's participatory action research, and his decolonial proposals and practices of a sociology *sentipensante* (Moncayo, 2009). Frantz Fanon, Paulo Freire, Camilo Torres, Silvia Rivera Cusicanqui, and the Zapatista movement are also instructive teachers of the pedagogies and intellectual genealogies of *sentí-hacer* (feel-make), *sentipensar*, and *sentipraxis* in the Americas.
9. As reported by the Antinarcotics Direction of the National Police on August 16, 2015, 17,017 of these cases have been rejected and archived, 474 proceeded to receive compensation, 14 did not accept the compensation offered, and 138 are still in process.
10. Canadian toxicologist Keith Solomon established this controversial buffer distance in a 2009 special issue of the *Journal of Toxicology and Environmental Health*. See Solomon and Marshall (2009).
11. See Plan de Manejo Ambiental PECIG.
12. Scientists at the Institute explained that environmental monitoring occurred by choosing 'representative soils' that displayed similar vegetative cover as the areas where PECIG operated. Soil samples were taken at three phases: Before the aerial fumigation, directly after the spraying, and 60 days post-fumigation.
13. DIRAN officially claims that they complete the verification process within 40 to 80 business days after a complaint is admitted. In most of the *quejas* I reviewed this was not the case. When I interviewed the lieutenant colonel in charge of the Complaint Direction of DIRAN in August 2015, he acknowledged this discrepancy and told me the DIRAN intends to expedite the process.
14. See Butler et al. (2016) for critical reflections on the way social movements, human rights advocates, and institutions create and refer to precarious or 'vulnerable populations' for whom political strategies are accordingly devised to ameliorate conditions of exposure and precarity.

## References

- Agard-Jones V (2015) Case #1: Chlordécone in France and the Antilles. Available at: [http://www.council.art/en/inquiries/29\\_the\\_manufacturing\\_of\\_rights/404\\_case\\_1\\_chlord\\_cone\\_in\\_france\\_and\\_the\\_antilles](http://www.council.art/en/inquiries/29_the_manufacturing_of_rights/404_case_1_chlord_cone_in_france_and_the_antilles) (accessed 23 February 2018).
- Andrews L (2015) Black feminism's minor empiricism: Hurston, Combahee, and the experience of evidence. *Catalyst: Feminism, Theory, Technoscience* 1(1): 1–37.
- Asoquimbo (2016) La naturaleza víctima de la Fundación Natura y USAID. Available at: <http://www.quimbo.com.co/2016/05/la-naturaleza-victima-de-la-fundacion.html> (accessed 23 February 2018).
- Barad K (2010) Quantum entanglements and hauntological relations of inheritance: Dis/continuities, spacetime foldings, and justice-to-come. *Derrida Today* 3(2): 240–268.
- Barbosa J and Ciro A (2017) Putumayo en el post-acuerdo: Las preguntas y los retos. *Razón Pública*, 14 May. Available at: <http://www.razonpublica.com/index.php/regiones-temas-31/10240-putumayo-en-el-post-acuerdo-las-preguntas-y-los-retos.html> (accessed 15 May 2017).
- Butler J, Gambetti Z and Sabsay L (eds) (2016) *Vulnerability in Resistance*. Durham, NC: Duke University Press.
- Camacho A and Mejía D (2015) The health consequences of aerial spraying of illicit crops: The case of Colombia. Center for Global Development working paper 408. Available at: <http://www.cgdev.org/publication/health-consequences-aerial-spraying-illicit-crops-case-colombia-working-paper-408> (accessed 25 February 2018).
- Cancimancel A (2014) *Echar raíces en medio del conflicto armado: Resistencias cotidianas de colonos en Putumayo*. PhD Dissertation, National University of Colombia, Bogotá, Colombia.
- Cancimancel A (2015) 'Tenemos el pueblo dentro de la finca': Itarca y la formación de un pueblo en la frontera entre el Putumayo y el Caquetá. *AlaorilladelRío*. Available at: <http://alaorilladelrio.com/2015/11/17/tenemos-el-pueblo-dentro-de-la-finca-itarca-y-la-formacion-de-un-pueblo-en-la-frontera-entre-el-putumayo-y-el-caqueta/> (accessed 23 February 2018).
- Censat Agua Viva (2016) Extravismo, negociaciones y paz. Available at: <http://censat.org/es/analisis/extractivismo-negociaciones-y-paz> (accessed 23 February 2018).
- Corpoamazonia (2008) *Agenda Ambiental: Departamento de Putumayo*. Mocoa, Colombia: Corporación SINERGIAZ.
- Das V (2007) *Life and Words: Violence and the Descent into the Ordinary*. Berkeley, CA: University of California Press.
- Das V (2015) What does an ordinary ethics look like? In: Lambek M, Das V, Fassin D and Keane W (eds) *Four Lectures on Ethics: Anthropological Perspectives*. Chicago, IL: HAU Books, 53–126.
- Escobar A (2014) Sentipensar con la Tierra. *Nuevas Lecturas Sobre Desarrollo, Territorio y Diferencia*. Medellín, Colombia: UNAULA.
- Fortun K (2001) *Advocacy after Bhopal: Environmentalism, Disaster and New Global Orders*. Chicago, IL: The University of Chicago Press.
- Gudynas E (2014) *Derechos de la Naturaleza y Políticas Ambientales*. Bogotá, Colombia: Jardín Botánico José Celestino Mutis.
- Gutiérrez Aguilar R (2006) *A Desordenar! Por una Historia Abierta de la Lucha Social*. México: Juan Pablos-CEAM.
- Hage G (2012) Critical anthropological thought and the radical political imaginary today. *Critique of Anthropology* 32(3): 258–308.
- Hetherington K (2011) *Guerrilla Auditors: The Politics of Transparency in Neoliberal Paraguay*. Durham, NC: Duke University Press.

- IDEAM (2015) *Sexto Boletín de Alertas Tempranas por Deforestación (AT-D)*. Bogotá, Colombia: IDEAM.
- Jain SL (2007) Living in prognosis: Towards an elegiac politics. *Representations* 98(1): 77–92.
- Lyons K (2016a) ¿Cómo sería una paz territorial? Iniciativas de justicia socioecológica en el Sur. In: *Salud al Derecho*, Bogotá, Colombia, 29 September.
- Lyons K (2016b) Decomposition as life politics: Soils, *Selva*, and small farmers under the gun of the U.S.-Colombian war on drugs. *Cultural Anthropology* 31(1): 55–80.
- Mesa Regional de Organizaciones Sociales del Putumayo, Baja Bota Caucana y Cofanía– Jardines de Sucumbíos (2015) *Putumayo: Sembrando Vida Construyendo Identidad. Historia de la Mesa Regional 2006–2014*. Bogotá, Colombia: Corcas Editores SAS.
- Moncayo VM (ed.) (2009) *Fals Borda, Orlando, 1925–2008. Una Sociología Sentipensante para América Latina*. Bogotá, Colombia: Siglo del Hombre Editores and CLACSO.
- Moreno MM (2015) Memoria histórica del origen de las fumigaciones 1978–2015. Available at: [http://www.mamacoca.org/docs\\_de\\_base/Fumigas/Memoria\\_historica\\_de\\_los\\_origenes\\_de\\_las\\_fumigaciones\\_MMMoreno\\_9mayo2015.html](http://www.mamacoca.org/docs_de_base/Fumigas/Memoria_historica_de_los_origenes_de_las_fumigaciones_MMMoreno_9mayo2015.html) (accessed 6 May 2017).
- Murphy M (2006) *Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience, and Women Workers*. Durham, NC: Duke University Press.
- Murphy M (2008) Chemical regimes of living. *Environmental History* 13(4): 695–703.
- Murphy M (2013) Distributed reproduction, chemical violence, and latency. *Scholar & Feminist Online* 11(3). Available at: <http://sfoonline.barnard.edu/life-un-ltd-feminism-bioscience-race/distributed-reproduction-chemical-violence-and-latency/> (accessed 25 February 2018).
- Nelson DM (2015) *Who Counts? The Mathematics of Death and Life after Genocide*. Durham, NC: Duke University Press.
- Papadopoulos D (2012) Worlding justice/commoning matter. *Occasion: Interdisciplinary Studies in the Humanities* 3: 1–25.
- Papadopoulos D, Stephenson N and Tsianos V (2008) *Escape Routes: Control and Subversion in the 21st Century*. London: Pluto Press.
- Programa de Naciones Unidas para el Desarrollo (PNUD) (2014) *Consideraciones Ambientales para la Construcción de una Paz Territorial Estable, Duradera y Sostenible en Colombia*. Bogotá, Colombia: Naciones Unidas Colombia and Cooperación Alemana.
- Ramírez MC (2001) *Entre el Estado y la Guerilla: Identidad y Cuidadania en el Movimiento de los Campesinos Cocaleros del Putumayo*. Bogotá, Colombia: ICANH.
- Ramírez MC (2005) Aerial spraying and alternative development in plan Colombia: Two sides of the same coin or two contested policies? *Revista: Harvard Review of Latin America*: 54–57.
- Red por una América Latina Libre de Transgénicos (2015) *Un Mal Cabalga Con El Viento: La Toxicidad y Carcinogenicidad del Glifosato*. Quito, Ecuador: Third World Network.
- Schrader A (2010) Responding to Pfiesteria piscicida (the fish killer): Phantomatic ontologies, indeterminacy, and responsibility in toxic microbiology. *Social Studies of Science* 40(2): 275–306.
- Simpson LB (2011) *Dancing on Our Turtle's Backs: Stories of Nishnaabeg Re-Creations, Resurgence and a New Emergence*. Winnipeg, MB, Canada: ARP Books.
- Solomon K and Marshall E (eds) (2009) Production of illicit drugs, the environment, and human health. *Journal of Toxicology and Environmental Health* 72: 15–16.
- Stengers I and Pignarre P (2011) *Capitalist Sorcery: Breaking the Spell*. New York: Palgrave Macmillan.
- Svampa M (2015) The ‘commodities consensus’ and valuation languages in Latin America. Available at: <http://www.alternautas.net/blog/2015/4/22/the-commodities-consensus-and-valuation-languages-in-latin-america-1> (accessed 8 March 2018).



- Taussig M (1999) *Defacement: Public Secrecy and the Labor of the Negative*. Stanford, CA: Stanford University Press.
- Tsing AL (2014) Blasted landscapes (and the gentle arts of mushroom picking). In: Kirksey E (ed.) *The Multispecies Salon*. Durham, NC: Duke University Press, 87–109.
- UNODC (2005) *Colombia: Monitoreo de Cultivos de Coca 2005*. Bogotá, Colombia: Oficina de la Naciones Unidas contra la Droga y el Delito.
- Uribe S (2013) *State and frontier: Historical ethnography of a road in the Putumayo region of Colombia*. PhD Dissertation, London School of Economics and Political Science, London.
- Vaisman N (2017) Variations on justice: Argentina's pre-and post- transitional justice and justice to come. *Ethnos* 82(2): 366–388.
- Vargas Meza R (1999) *Fumigación y Conflicto. Políticas Antidrogas y Deslegitimación del Estado en Colombia*. Bogotá, Colombia: TNI/Acción Andina.
- Weizman E (2017) *Forensic Architecture: Violence at the Threshold of Detectability*. New York: Zone Books.
- Wilches-Chaux G (2012) Supongamos la paz con la naturaleza. *El Tiempo*, 22 September. Available at: <http://www.eltiempo.com/archivo/documento/CMS-12245564> (accessed 23 February 2018).
- Zibechi R (2007) *Dispersar el Poder: Los Movimientos Como Poderes Antiestatales*. Quito, Ecuador: AbyaYala.

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