

# Political Ecologies of Global Health: Pesticide Exposure in Southwestern Ecuador's Banana Industry

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**Abstract:** Pesticide exposure in Ecuador's banana industry reflects political economic and ecological processes that interact across scales to affect human health. We use this case study to illustrate opportunities for applying political ecology of health scholarship in the burgeoning field of global health. Drawing on an historical literature review and ethnographic data collected in Ecuador's El Oro province, we present three main areas where a political ecological approach can enrich global health scholarship: perceptive characterization of multi-scalar and ecologically entangled pathways to health outcomes; critical analysis of discursive dynamics such as competing scalar narratives; and appreciation of the environment-linked subjectivities and emotions of people experiencing globalized health impacts. Rapprochement between these fields may also provide political ecologists with access to valuable empirical data on health outcomes, venues for engaged scholarship, and opportunities to synthesize numerous insightful case studies and discern broader patterns.

**Resumen:** La exposición a agroquímicos en la industria bananera del Ecuador evidencia procesos de ecología y economía política interactuando en diferentes escalas y que terminan afectando a la salud humana. Este estudio de caso ilustra como la ecología política de la salud puede aportar al creciente campo de la salud global. A partir de una revisión histórica de literatura y de datos etnográficos recopilados en la provincia de El Oro, Ecuador, presentamos tres áreas principales donde la perspectiva de ecología política puede enriquecer el campo de la salud global: caracterización perspicaz de trayectorias multi-escalares y ecológicamente relacionadas que afectan a la salud; valoración crítica de dinámicas discursivas tales como las narrativas escalares contrapuestas; y apreciación de subjetividades y emociones relacionadas con el ambiente entre personas que viven impactos de salud global. El acercamiento entre estos dos campos también puede proporcionar a los ecólogos políticos acceso a valiosos datos empíricos sobre salud, espacios para la praxis y oportunidades para sintetizar numerosos estudios de casos perspicaces para discernir patrones más amplios.

**Keywords:** global health, political ecology, engaged scholarship, occupational health, ecosystem health

**Palabras clave:** salud global, ecología política, praxis, salud ocupacional, salud del ecosistema

## Introduction

Building on decades of political ecology scholarship exploring human–environment relationships, a growing body of *political ecology of health* scholarship examines how evolving political, economic and environmental factors interact with human health (Jackson and Neely 2015; King 2010, 2015). In this paper, we make a case for strengthening collaboration between political ecologists and researchers in the burgeoning field of *global health*. While specific boundaries of global health are notoriously difficult to pin down, a prominent consensus definition holds that it “emphasizes transnational health issues, determinants, and solutions; involves many disciplines within and beyond the health sciences and promotes interdisciplinary collaboration” (Koplan et al. 2009:1995). Common targets of global health initiatives include infectious diseases in the global South, especially HIV, tuberculosis and malaria; increasing attention to non-communicable diseases; and consequences of global interconnectedness whereby diseases such as SARS or Ebola can threaten diverse locales and populations, including those in the global North (Crane 2013; Herrick and Reubi 2017). We argue that enhanced engagement by political ecologists with global health research extends three main opportunities for cross-fertilization and learning: (1) to comprehensively characterize multi-scalar and environmentally entangled pathways leading to health impacts in specific places; (2) to inform health interventions with critical analysis of scalar narratives and other discursive considerations; and (3) to foreground the environment-linked subjectivities and affective reactions of people experiencing “global” health issues.

We illustrate these points using a political ecology account of pesticide-related health impacts in Ecuador’s southwestern El Oro province, a prominent locus of the world’s banana industry where widespread occupational and environmental exposure to toxic chemicals has been conspicuous—and where economic power and ecological dynamics can readily be considered in relation to health outcomes and narratives. We begin by reviewing critical literature on global health to explore what political ecologies of global health scholarship can offer. The case study is next presented in two stages: the first, an historical overview of the ecological and social origins of pesticide hazards in Ecuadorian banana production; and the second, an ethnographic exploration of pesticide risk perception in El Oro (Brisbois 2016). The case study provides the basis for a subsequent consideration of the three main opportunities listed above. Finally, while much of our discussion emphasizes the potential benefits of political ecology for global health, we also illustrate how this exchange might contribute to broader political ecological concerns and debates. Global health is an overwhelmingly applied field in which enormous financial and human resources are brought to bear on pressing health issues among marginalized groups, generating both important empirical findings and numerous venues for engaged scholarship. While acknowledging the importance of non-applied studies in both political ecology and global health (Lave 2014; Pigg 2013), our analysis

supports rapprochement between these fields particularly to inform praxis, a longstanding but consistently challenging objective of many political ecologists. In particular, we illustrate specific ways in which political ecologies of global health can foreground, and speak to, interventions aimed at improving health.

### ***Social Scientific and Critical Perspectives on Global Health***

Accompanying the enormous profusion of biomedical global health work in recent decades is a growing body of critical scholarship, which has identified numerous distinctive, often problematic, tendencies in the way global health is conceived and practiced (Brown et al. 2012; Herrick and Reubi 2017). The urgency to just “do something” about pressing global health problems, for example, can shut down reflection on the power-laden ways in which those problems are constructed (Pigg 2013). Such constructions often employ a totalizing biomedical gaze that obscures the lived experiences of global health’s alleged beneficiaries in the global South (Adams 2013; Biehl and Petryna 2014). As geographers have demonstrated, this gaze also often invokes imaginative geographies in which the global South is inexplicably or accidentally poor, and therefore amenable to technological biomedical approaches (e.g. medical interventions as opposed to political remedies to problems of inequity) (Sparke 2009). Indeed, the very establishment of global health as a field has typically relied on the existence of exotic places impoverished enough to qualify as sites for its practice, therefore raising core political questions about colonialism’s ongoing impacts (Crane 2013; Janes and Corbett 2009). As Anderson (2014:372) has pointed out, the “global” in global health is typically celebratory or breathless, and such “scale making in biomedicine” obscures the colonial roots of both global health problems, and biomedicine’s epistemologies. Historical analyses, conversely, while typically not focused on the contemporary global health era, have vividly illustrated the reciprocal interactions of colonialism, environmental change, health and health science in the global South (e.g. Mitman and Erickson 2010).

Additional important findings of critical global health scholarship include the ways in which the dominance of epidemiologic and “evidence-based reasoning” in global health obscures not only local realities and colonial legacies, but also present-day processes of neoliberalization (and its beneficiaries) driving “health inequities”, or unfair population-level health burdens (Adams 2013; Birn 2009; Schrecker 2013; Spiegel et al. 2015). These health-damaging political economic factors include increased income inequality; reduced public sector spending on health; weakened protections for workers and the environment; promotion of uncontrolled resource extraction and export-based agro-industry; migration of health professionals to the global North; limited access to essential medicines under intellectual property laws; and attribution of health status to individual behaviours and characteristics (Labonté et al. 2011). As one current in such work, governmentality-focused analyses highlight the promotion of technologies of self-management as part of the broader neoliberalization of health (Sparke 2016). In response to the individualizing or technological impulses that dominate the field, however, vocal movements for “health equity” and the “human right to health” advocate—with

mixed results—for policies and research approaches that operationalize social justice in health (Birn 2009; Herrick and Reubi 2017; Schrecker 2013; Sparke 2009).

Political ecologists will recognize many of their usual themes and approaches in this brief survey of critical social science scholarship on global health—political economy, power relationships, subjectivities, discourse, ethnography, and inequities. It is precisely these sorts of emphases that would be further augmented with greater attention and resources to political ecologies of global health. A common refrain among social scientists studying global health is the need for *more* social scientific studies, suggesting that while growing, scholarship on political economy, discourse and lived experiences has nevertheless remained relatively marginal to the broader field. As King (2010) observes, furthermore, political ecology brings together multiple important analytic lenses (political economy, ecology, discourse) not often applied concurrently in the health realm, including in critical global health scholarship. In particular, political ecology's attention to the role of environmental dynamics can provide further insight into the socially and materially “entangled” role of non-human actors in the causes and interpretations of global health issues (cf. Craddock and Hinchcliffe 2015; Nading 2014).

### ***Political Ecologies of Health***

We concur with the view that political ecology is less a methodology than “a *community of practice* and ... a *certain kind of text*” (Robbins 2012:5, emphasis in original). As such, political ecological approaches typically situate present-day environmental conditions in historical context, and especially seek to understand how particular places and populations are affected by forces operating at multiple scales, taking into account complex “webs” of relationships connecting social and ecological actors (Blaikie and Brookfield 1987; Rocheleau 2008). In addition to examining the material and biophysical causes of environmental change and injustice, political ecologists have documented related discursive dynamics and political struggles around environmental issues (Peet and Watts 2004). Of particular importance for engagement with “the global”, political ecologists have shown the relevance to environmental justice of *scale politics*: struggles over the composition, inter-relations and pertinence to a given issue of particular scales (Neumann 2015). While scale is understood to be discursively constructed rather than ontologically given, efforts by social actors to normalize particular scalar interpretations of environmental issues are politically consequential, consistent with the differing importance placed by various global health scholars on “the molecular”, “the individual” and “the global” in the critical global health literature reviewed above. Feminist political ecology has also illustrated the gendered nature of environmental knowledges and inequitable patterns of access to environmental resources, and of toxic exposures (Rocheleau et al. 2013). Gendered subjectivities and dynamics reflect human–environment relationships, intersecting with axes of social difference such as race, ability, age, class and caste (Hawkins et al. 2011). Building on these insights, political ecological work on emotions illustrates their role in mediating impacts of, and responses to, environmental change and unfair power relations (Sultana 2015).

These core themes in political ecology are reflected in *political ecology of health* approaches focusing specifically on human health.<sup>1</sup> Mayer (1996) advocates political ecology of *disease* approaches in medical geography through combination of political economy with disease ecology. Over a decade later, King (2010) emphasizes the need for acknowledgement of multiple political ecology traditions, outlining what political ecologies of health can contribute to health geography: multi-scalar political economy analyses of environmental change, health and health decision-making; recognition of reciprocal relationships between health and environment; and interrogation of health discourses produced by institutions and other actors. King (2015:346) distinguishes political ecologies of disease from political ecologies of health, in that the latter view health in a holistic, dynamic and embodied sense that encompasses “longterm well-being and individual agency”. Reflecting this shift, recent conceptual work has begun to break down artificial distinctions between external environments and internal ecologies within human bodies, as illustrated by the epigenetic effects of environmental toxins on gene expression (Guthman and Mansfield 2015). Such environmental influences on allegedly behaviour-linked conditions such as obesity challenge moralistic emphases on individual responsibility as a determinant of health, paralleling the governmentality-focused global health analyses described above (see also Galt [2013] on how the “complex subjectivities” of pesticide users complicate behavioural pesticide-safety approaches). Building on such developments and operationalizing insights from medical anthropology, science and technology studies, and the history of medicine, Jackson and Neely (2015:52) tackle the challenge of “how to do a political ecology of health”. They stress the need for acknowledgement of knowledge as situated and partial, use of Marxist-feminist approaches, and foregrounding of the role of “the non-human”.

Empirical political ecologies of health (and disease) have traced the interaction of political economic processes with ecosystem change and related health outcomes, as well as how such interactions are understood and assessed by various institutions, practitioners and affected individuals and groups. Particular attention to history (and the methodological value of historical documentary sources) is evident in Turshen’s (1984) account of export-based plantation economies, proletarianized rural labour reserves, health services, and land use-related health outcomes in colonial and post-colonial Tanzania. Neely’s (2015) ethnographic exploration links “internal ecologies” of tuberculosis sufferers in South Africa to “local biologies” of high HIV prevalence rates, which are interpreted in locally specific ways. Such a focus on local interpretations also invites attention to the role of individual and collective agency, not just in experiencing ecologically linked health outcomes, but also in responding to them. Harper (2004) documents different responses to environmental injustice in inner-city Houston, showing how air pollution’s disproportionate impacts on African-American and Latino residents can motivate activism (but also fatalism). The role of understandings of health in social movements is also underscored by McSweeney and Pearson’s (2013) study of Indigenous maternal and child health in lowland Latin America. They point out that issues involving maternal morbidity and childhood vaccination reflect

centuries-long processes by which Indigenous peoples have been dispossessed of their lands, but also that data on such health issues can serve as a locus of struggle in Indigenous empowerment movements—movements that can, in turn, limit the negative ecological impacts of resource extraction.

While political ecologists have begun to study issues that are central to global health, such as HIV/AIDS in sub-Saharan Africa (King 2015; Neely 2015), such work has largely taken place within the boundaries of geography or anthropology. Political ecologies of health, moreover, have thoroughly explored political and discursive elements of health outcomes or interventions, but have been relatively quiet regarding the challenge of applying such insights to specific public health policies or programs (but see McSweeney and Pearson 2013; Mulligan et al. 2012; Neely 2015). Our focus on the intervention possibilities generated by political ecologies of global health speaks specifically to this disconnect. In the remainder of this paper, we draw out details of a revealing case study to build on the body of scholarship described above, particularly to make more evident types of themes and interventions that might be important foci and points of engagement for global health and political ecology. After providing details on the case study, we return to our three key themes to explore the potential of this engagement to generate health research that is empirically sound and socially nuanced, attentive to ecological dynamics, and geared to promoting the emancipatory projects of groups facing environmental injustice

### **Case Study: A Political Ecology of Pesticides and Health in Ecuador's Banana Industry**

The case study is presented in three parts, beginning with (1) a review of existing literature to situate pesticide exposure in Ecuador's banana industry in multi-scalar, historical context. The subsequent sections draw on an ethnographic study of pesticide risk perception to illustrate (2) scalar narratives by which residents of El Oro (Orenses) make sense of pesticides and health, and (3) the emotions and subjectivities of Orenses experiencing and responding to pesticide exposure and other health impacts of globalized banana production. The ethnographic study was carried out by the first author, and explored how banana farmers and workers in El Oro understand the risks to their health from pesticides: what they perceive the causes and effects of pesticide exposures to be, how pesticide exposure fits into overall understandings of the world, and what should be done in response. The study involved eight months of fieldwork over a five-year period, and employed unstructured observation, key informant interviews and semi-structured interviews with Orense farmers and workers (Brisbois 2016).<sup>2</sup> The analysis in this paper is primarily based on 15 semi-structured interviews with 30 participants (some interviews involved multiple people), conducted in the last four months of 2011 when especially low prices created a "banana crisis". Interviewees were identified using snowball sampling, beginning with members of a local banana-producer cooperative, and were a mix of banana industry employees (16) and small or medium-scale farm owners (14); and men (23) and women (7). Both the historical review and ethnographic fieldwork were carried out within a research program on

interactions between food systems and health equity (Spiegel et al. 2015). The case study reveals interacting and multi-scalar influences of political economic and ecological factors on pesticide exposure, but also on related social determinants of poor health; competing, class-linked scalar narratives featuring both individualizing and structural explanations of pesticide risk; and both hopeless and hopeful affective reactions to life in the globalized banana industry.

### ***Part 1: Bananas, Pesticides, and Health in Historical Context***

El Oro province is on Ecuador's southwest coast. Its capital, Machala, is the self-described "banana capital of the world". In the early 20th century, a "cacao boom" resulted in widespread clearing of land in the coastal region, and contributed to massive migration of landless highland Ecuadorians to the coast. While the cacao industry collapsed by the 1930s, the cleared land, labour and capital (both foreign and Ecuadorian) it helped to assemble in the coastal region would play major roles in the next stage of the region's agrarian development. The dynamics of cacao and, later, banana production, in which demand in the global North spurred agro-export production in Ecuador, reflect the country's inequitable insertion into the global economy in the aftermath of the colonial period (Larrea 2006).

By mid-century, the infamous United Fruit Company (UFC) was anxious to escape the confines of Central America and Colombia, where organized labour, nationalist governments and the devastating "Panama disease" fungus were making banana production increasingly risky (Soluri 2006). The start of large-scale banana production on UFC's Hacienda Tenguel, in a border region of El Oro and two neighbouring provinces, helped spark Ecuador's first "banana boom" and further waves of migration to the coast (Larrea 2006). The eventual arrival of Panama disease in Ecuador and job cuts on the decreasingly productive Hacienda were met with increasing labour militancy, however, and land invasions by newly unemployed banana workers. Traditional gender roles, which had been promoted by United Fruit as a way of ensuring a compliant labour force, came to serve as a site of resistance once layoffs began (Striffler 2002). The occupation of Hacienda Tenguel contributed to UFC's abandonment of direct production of bananas in Ecuador, and adoption of a contract-based banana production model that would transform the industry (Striffler 2002). Over the following decades, bananas were produced under contract by both large plantations and "small farmers" (*pequeños productores*) for UFC (now known as Chiquita), other transnationals, and large Ecuadorian firms. Revenues from banana production strengthened state and civil service formation in Ecuador's (highland) capital Quito and commercial development in the coastal metropolis of Guayaquil, while leaving rural banana-growing areas impoverished (Larrea 1987).

Conventional banana production (an extreme monoculture) is pesticide intensive, in response to the interaction of political economic dynamics with a range of non-human entities: soil, insects, weeds, rainfall and especially the *sigatoka negra* fungus, which attacks banana leaves and reduces yields (Henriques et al. 1997). The complex role of environmental factors was dramatically demonstrated in 1998 by Hurricane Mitch, which devastated Central American banana plantations and

prompted multinationals to purchase additional bananas from independent producers in Ecuador (Frundt 2009). This improved bargaining position allowed Ecuadorian producers Bonita and Favorita to bypass the large multinationals and negotiate contracts directly with multinational supermarket chains—themselves increasingly able to dictate terms in the banana industry. In addition to establishing itself as a major player in the international banana market, Bonita was largely successful, with Ecuadorian government support, in suppressing unions on its plantations. Del Monte, Dole and Chiquita also used Hurricane Mitch as a pretext for laying off unionized workers in Central America, and sourcing more bananas from Ecuador and other countries with non-unionized plantations (Frundt 2009). This recurring role of non-unionized banana locales as safety valves for the transnationals fits Striffler's (2009) observation that lack of unionization in Ecuador has served to discipline labour throughout the hemisphere.

Reflecting these interactions between capital, labour and environmental factors, the current contract-based model of banana production shifts risk downward from large transnationals to the independent farm owners from whom they often buy bananas under contract—but to whom they have minimal obligations in the event of crop loss or price drops. Farms, in turn, typically follow a precarious-labour model, in which workers are hired on a temporary basis, provided with no job security or benefits, and aggressively prevented from unionizing (Martínez Valle 2004; Polo Almeida 2015). These dynamics were reinforced during Ecuador's experience of structural adjustment, whose main objectives included promoting agro-industrial exports (especially bananas and cut flowers) and acceleration of integration in global markets. This occurred especially through petroleum production expansion, and was also accompanied by reduced spending on areas such as health to lowest per capita rates in the Americas (Breilh and Tilleria 2009). Subsequent transnational linkages adapting to this intensified export orientation include fairtrade and organic certifications, which attempt to address power imbalances and environmental problems in the industry, albeit in ways that are often contradictory (Frundt 2009). US and European labour and environmental groups have put additional pressure on banana giants in the face of environmental damages and intimidation of labour organizers in Latin America (Frundt 2009). Negative publicity highlighting such tendencies was prominent during the 2006 Ecuadorian presidential election campaign, in which Rafael Correa defeated Álvaro Noboa, majority owner of Bonita. Correa's election sparked "counter-globalizing" tendencies such as resistance to international financial institutions (IFIs) and (some) increased protection for workers in the industry (Frundt 2009; see also Harris and Roa-Garcia [2013] on "post-neoliberal" and counter-IFI movements in Ecuador and elsewhere).

Present-day interactions of agro-industrial development with precarious employment generate widespread pesticide exposures that disproportionately affect poor and marginalized workers, farmers and surrounding communities (Breilh et al. 2007; Harari et al. 2011). Workers often lack appropriate training and protective equipment, and the ability to voice complaints without being fired. Poor enforcement of pesticide legislation allows aerial fumigations to take place while workers are still in the fields, and to contaminate adjacent schools and



communities. Banana labour is no longer exclusively done by men, but the arrival of women on plantations (in a subset of tasks such as packaging bananas and applying stickers) has paralleled the devaluation of banana work through contract-based production and related obstacles to labour organizing (Striffler 2002). Exposures to pesticides are gendered, as men and women (and sometimes children) play different roles on large- and small-scale banana farms, and have different patterns of environmental exposure in rural areas (Harari et al. 2011; Martínez Valle 2004). A handful of preliminary Ecuadorian health studies suggest pesticide-related impacts such as skin and respiratory problems, neurobehavioural impairment, endocrine disruption, and birth defects and other reproductive issues (Breilh et al. 2007; Harari et al. 2011; Maldonado and Martínez 2007). Apart from the example of DBCP (a now banned pesticide known to cause sterility; Wesseling et al. 2001), however, firmly establishing causal links between specific pesticides and health effects in the banana industry is difficult. Studies on pesticide-exposed banana workers elsewhere in Latin America have found elevated rates of dermatological conditions, cancer, eye problems, and long-term neurobehavioral impacts (Wesseling et al. 2001, 2010). Pesticide mixtures vary between farms and over time, however, and exposure to both pesticides and potential alternative causes of illness is difficult to assess because of complex employment situations, uncooperative employers, long latency periods for many health problems, and fraught life histories (London 2009).

Existing epidemiological evidence therefore suggests likely health impacts of pesticides, but also a need for caution in stating exactly which impacts are occurring. In addition, scholarship on the social determinants of health (“the circumstances in which people are born, grow, live, work, and age”) reveals that occupational pesticide exposure is a proxy for numerous additional contributors to poor health: lack of education, low and precarious income, and unhealthy housing and neighbourhoods, among others (CSDH 2008:26; London 2009). Incorporating such epidemiological insights allows for greater precision (and caution) regarding the “health” portion of our political ecology of health account. Our portrayal of the historical production of pesticide exposure and health outcomes in Ecuador’s banana industry therefore benefits from political ecology’s attention to power, discourse and “the non-human”, but is also critically cognizant of global health’s typical epidemiologic approaches and sources of data.

## ***Part 2: Competing Scalar Narratives of Pesticides and Health in El Oro***

A second political ecological contribution to understanding global health issues is suggested by ethnographic attention to discursive phenomena such as scalar narratives of pesticides and health. Political ecologists have shown that the scalar configuration of environmental issues is a key locus of discursive struggle over access to environmental resources and freedom from environmental harms (Neumann 2015). As recounted in semi-structured interviews, Orense narratives were often remarkably consistent with the historical political ecology account of the previous section—populated with human, non-human and corporate actors

interacting in power-laden ways.<sup>3</sup> For example, the power relations and health implications of precarious work in contract-based production were vividly illustrated by one landless worker:

My salary is \$200. Sometimes I don't get even that much because the plantation doesn't get a fixed price [per case of bananas]. There are days I earn 10, days I earn 20, days I earn eight, but more-or-less I earn \$200 monthly. I don't get enough for even the basics ... imagine if my wife or I get sick. With \$200, when you get sick, how can you pay the doctor? And if we all get sick at the same time, we'll just have to die ... Sometimes you want to complain but, out of fear or timidity ... you put up with it because you have to feed your children. If you complain, they fire you.

With respect to pesticide exposure, interview participants described a range of relatively mild health effects such as skin irritation, headaches, sore throats and respiratory issues. More serious impacts listed by multiple interviewees (often ones they had heard about but not experienced personally) included birth defects, sterility in men, cancers and death. Three farmers recounted their own experience with serious pesticide intoxication, while another reported an allergic reaction forcing him to abandon banana production and convert his farm to cacao. Importantly, individuals discussing health impacts often moved on to effects on non-human actors. Many individuals over about 40 years of age, for example, felt that banana production had decimated the coastal region's biodiversity:

When I was little, you didn't need any chemicals ... you could pick a banana wherever you wanted, or a fruit, and it was healthy. Now, because of the sigatoka, if you plant an orange tree over here, the airplane fumigates it and you get pure chemical ... In the water, there were lots of fish, all the micro-organisms [animalitos] ... there were little birds, butterflies. Now with the chemicals, they've gone away.

Another small farmer's account of pesticides, health, and the agroecological results of indiscriminate pesticide use introduced the theme of corporate malfeasance:

It would be better, one day, to produce a banana that doesn't need fumigation for the sigatoka ... it could happen—even though they say it's impossible, because if they produce a banana that doesn't require fumigation, it will end the business of the companies that sell the pesticides.

Consistent with a political ecology emphasis on influences across scale, another small farmer knowledgeably discussed the agroecology of microscopic soil nematodes and the influence of hurricanes in Central America on international banana markets, also highlighting the greed of corporate actors in the global North:

We're talking about products manufactured in the North ... that shouldn't be exported to the countries here in South America where, due to ignorance or greed, human health doesn't matter ... for example, the carbamates [a class of hazardous pesticides], demonstrated to be carcinogenic, mutagenic. They cause very serious problems in the liver, in the pancreas, and also cause mutations, in reproduction. Guilty! Guilty also the authorities here in our country, very guilty, complicit in all this. But also very guilty are these lying companies ...

More generally, and consistent with the observation that pesticide exposure is a proxy for numerous social determinants of poor health, interviewees would typically move from health and environmental effects to economic considerations and inequity. In the words of one small farmer:

All these chemicals are harmful. We have lots of knowledge about this. But the situation in our country is critical, with the lowering of the price of the fruit, all the time. So we Ecuadorians, we who live from banana, we live marginalized.

Such narratives of small farmers and workers typically highlighted inequities between workers and farm owners, or between small-scale producers and large farms or fruit transnationals:

Here it would be the authorities, the government, who would get involved in the [problem of aerial fumigations], ideally with some drastic measures, especially where there are settlements inside or near the plantations. They should make a space of some 200 or 300 meters, and not fumigate there. You can say it, but because you're not the farm owner ... they buy justice, buy the authorities. It's difficult. The rich have the power.

In addition to such “multi-scalar” relationships, however, a political ecology focus also motivates attention to the ways in which scale itself is socially produced through discursive efforts with political ramifications. As we have documented elsewhere, and in contrast to the structural Orense narratives discussed above, many locally situated explanations of pesticide exposure and other health hazards highlighted *individual* behaviours and characteristics (Brisbois 2016). Such factors included unhealthy eating, drug and alcohol abuse, and neglecting to protect oneself from pesticides. Individualizing narratives would sometimes attribute health problems to “culture” (*la cultura*; often translated as “education” or “refinement”), as for one university-educated small farmer:

There are people who eat everything and think that the more they fill their bellies, the better fed they are, when this isn't true. It's not a question of the quantity of food, but the quality. It's something cultural that we have to change little by little.

In such accounts, recommendations for better education flowed logically from attribution of poor health to behaviours. Interestingly, however, many individualizing narratives, in which personal (ir)responsibility was highlighted as a health determinant, were voiced by individuals with at least some privilege and wealth about *others*: most prominently by large and small farm owners (often with some post-secondary education) about landless labourers, but also by some older or more financially secure labourers about younger workers. These same relatively privileged individuals might also invoke more structural, multi-scale explanations of their own problems, suggesting a complex interaction between social location—especially class—and scale-linked explanations for health and other problems. Individualizing explanations of health problems voiced by Orenses resonate with persistent, but problematic, currents in pesticide-health research, and public and global health more generally (Brisbois 2016; Galt 2013; Guthman and Mansfield 2015; Sparke 2016). Thus attention to competing environmentally linked narratives—a hallmark of political ecology—deepens understanding of how such

narratives select for different responses to ecologically entangled global health issues.

### ***Part 3: Global(ized) Subjectivities and Affect***

While scalar and other narratives circulate both locally and globally, they are also internalized, challenged and modified by individuals whose “complex subjectivities” (Galt 2013) incorporate their social location and relationships. The affective dimensions of narratives voiced by Orense banana farmers and workers shed light on embodied experiences of health, and potential courses of action to be taken to maintain or improve it. In keeping with the sometimes overwhelming nature of banana market forces, for example, Orenses often discussed health and other social problems with a sense of inevitability, as for one male small farmer:

We live surrounded by banana farms. Here there's one, and another on the other side, and our house is in the middle. And there's a lot of chemical, and it's affecting our health ... There's not time. The plane passes and it gets you, even if you run to the house it still gets you. It bathes you.

Perceived inevitability sometimes even verged on fatalism, as when an agricultural engineer in charge of pesticide applications on a large farm speculated that his job might be at the root of his respiratory issues, but also of more profound implications (he might be left sterile, as his wife half-jokingly interjected). In a transnational industry, perceived inevitability was unsurprisingly tied up with links between Ecuador and banana-consuming countries. The same engineer pointed to standards imposed by northern supermarket chains, explaining that: “If they didn't impose rules, we wouldn't do anything” (several other interviewees also indicated that banana buyers should impose conditions on banana producers to improve working and environmental conditions). The potential emotional impacts of such transnational relationships were illustrated by a male small farmer who described himself as:

At the mercy of whatever company buys what we're producing. Now *we're suffering*, now we're ruined ... If you don't have money, how can you care for your life? You could be really half-sick, in bed, because there's no money to get cured. And this is the situation of us banana farmers. At times, *one loses hope*. Some deceive themselves, say that next year will be better. *We get excited*. Then the next year it's the same bullshit [*pendejada*].

Anxiety due to banana market conditions (especially during the late 2011 price slump) was also explicitly linked to health by a female producer who indicated that: “We also should have mental health, psychological health. Because *with such a crisis, one ends up in turmoil* [*trastornada*] ... the illness of the century is stress”. Another woman in the same interview (an agricultural engineer managing banana exports for a fairtrade co-op) elaborated on the gendered causes of stress:

Imagine, I get up at five in the morning, I make the [family's] lunch, then at seven I come here [to the co-op office], really quickly ... Imagine, *living an accelerated life* ... Right now, there's a *deadly stress* [*un estrés fatal*].

In contrast to such negative emotions, however, were themes of resistance and hope. The role of cooperatives as a source of relief was colourfully expressed by one male small producer:

Christmas is coming and every year we say “Happy New Year” brother, how happy ... instead we should say “cursed new year” [*maldito año*], because instead of being better, it’s worse! This year, three months were better, and then nine months of getting screwed [*nueve meses de joda*]. *But at least we have the cooperative* that’s giving us the same [price per case of bananas]. At least we’re eating.

Many fair trade-certified producers in the Ecuadorian coast are certified organic, and organic methods (whether certified or not), were also cited by numerous Orenses as a possible escape from the problems of conventional banana production. One female organic farmer’s account of her transition to organic farming suggests affective reactions to banana markets, also involving health and the environment:

In the time when we were conventional, *we suffered a lot*. The small producer is always last. The big producers always got the exports and when there was extra demand, the small producers would get it. Apart from this, chemical products can affect your health. So we heard of [an organic co-operative], and we decided to start like that ... But even when we were conventional, we never used nematicide [a pesticide for soil nematodes, or worms] ... because it always damages the earth. The earth dries, the bacteria, fungi, everything dies.

The appeal of organic production extended beyond small farmers, as the agricultural engineer who speculated that his health had been affected by years of working with pesticides described his dream of retiring and cultivating bananas organically. Thus numerous Orenses would incorporate environmental elements in hopeful narratives of escaping oppressive conditions in the globalized banana market, in addition to the relief provided by fairtrade support and organization into cooperatives. Many such hopeful narratives described links with banana consumers as providing motivation: “The fact that we sell our fruit through fairtrade, that’s a lot, because it motivates us, and not only ourselves, but also for our community through the premium” (a supplement to the price of every case of bananas sold, that goes to social projects among fairtrade producers and their communities). One group of female small producers (including those above facing “a deadly stress”) neatly tied together themes of transnational connectivity, organic production, and hope:

There are always talks [in the fairtrade co-op], they always help ... they motivate us to keep progressing, to keep fighting [*luchando*], with all the obstacles there are right now ... not only conventional [banana production], but also to try to change, to be organic. I think that’s the future, with organic bananas.

Thus a political ecology lens attending to affective dimensions at the intersection of health, environment and political economy suggests ways in which individuals embody and experience unfair power relationships and health-damaging ecologies. The emotional dynamics of the ways in which they are pushing back,

furthermore, illustrate a locus of praxis for engaged researchers in both global health and political ecology.

## **Discussion**

The preceding case study now serves as a basis for revisiting the three main areas we have identified where political ecology and global health scholarship could be productively brought together. We finish by highlighting opportunities and challenges that may be encountered in such collaborations.

### ***Comprehensive Characterization of Interacting Multi-Scalar Political, Economic, and Ecological Pathways to Health Outcomes***

The problem of pesticide exposure in El Oro vividly illustrates pathways to (global) health outcomes featuring entangled human and non-human entities (cf. Nading 2014): multinational corporations, governments, farmers and workers, consumers, chemicals, insects, fungi, and soil. This potential contribution to global health is particularly illustrated by political ecology's focus on the power relations driving these entanglements, and generating outcomes such as health impacts among precariously employed banana workers and farmers. Specific opportunities for application of such insights exist in the realm of engaged scholarship on global governance for health (Lee et al. 2011). The banana-related case study described in this paper could motivate attempts by researchers and civil society partners to advocate for consideration of health and agro-ecosystem dynamics in international trade agreements, through better environmental and labour-rights reporting and enforcement mechanisms. Within individual communities, however, some global health scholars are already attempting to address ecological influences using One Health and Ecohealth approaches (Wernli et al. 2016). While such fields relate human to animal and ecosystem health, their practitioners are typically inattentive to the kinds of large-scale political economic power dynamics that political ecologists often take as their starting point (Dakubo 2013; Wallace et al. 2015). For example, only limited health improvements are likely to be achieved through community-based work with the banana farmers and workers featured in this paper without linking to existing transnational environmental and social solidarity movements. There is also a concurrent need to confront the role of transnational fruit and pesticide companies in generating precarious and hazardous working and living conditions. The agro-ecological dynamics of pesticide exposure in El Oro, furthermore, are conditioned by Ecuador's colonial past, and neoliberal (or perhaps "post-neoliberal") present (Harris and Roa-Garcia 2013; Larrea 1987). These entangled ecological and political economic realities suggest additional intervention possibilities such as emancipatory participatory projects involving political ecologists, global health scholars studying environmental injustice, and communities actually experiencing these risks (cf. Galt 2013). And while the agriculture-focused case study explored here is somewhat marginal to central foci in global health such as infectious diseases and clinical medicine, work on "internal

ecologies” of HIV sufferers in health care settings (Neely 2015), and on agroecological implications of living with HIV (King 2015), suggests that ecological entanglements remain relevant in more clinical contexts.

### ***Attention to Scalar Narratives and Discourse***

A political ecology take on pesticides and health in El Oro also reaffirms the importance of discursive analyses in understanding and responding to global health issues. Our particular focus on scalar narratives of Orenses with varying degrees of marginalization in the banana industry and Ecuadorian society illustrates how they make sense of, and respond to, health inequities (Brisbois 2016). While more structural explanations for health issues typically lead to “collectivist” intervention strategies (Masuda et al. 2012), persistent *individual-scale* explanations for the health of—usually poor, landless, young—others are consistent with individualizing neoliberal ideologies (Harris 2011). The techniques of governmentality through which individual-focused narratives are internalized in this setting merit further examination (Sparke 2016). Such individualizing scalar narratives also likely form part of the chain (or web) of explanation of environmentally linked health outcomes, if they stabilize inequitable political economic structures generating such outcomes. Community-based environment-health approaches can draw on such insights to address scale-linked political views head-on, and avoid repeating ineffective behaviour-change strategies with reactionary political implications (Brisbois 2016; Galt 2013). Tracing pathways to health outcomes “across scales”, as a potentially useful heuristic, should therefore also acknowledge that the ways in which the world can be divided up into scales (global, local, individual, molecular, etc.) are not self-evident or politically neutral (Neumann 2015).

Accordingly, uncritical representations of the scales of “the developing world” and “the global” are especially important to challenge. Stereotypes of the global South as constitutionally poor have been shown to promote or justify particular technical and depoliticized global health approaches (Brisbois 2014; Sparke 2009). A general “euphoric” tendency to celebrate globalization enables forgetting of the colonial legacies that make global health problems persistent, and render the field of global health possible (Anderson 2014:374). As feminist geographers have illustrated, furthermore, viewing the global as a monolithic driver of change “performs” the global scale in ways that disempower local places and reinforce the power of allegedly global forces (Gibson-Graham 2002). Banana workers and farmers, however, have shown that collective action in places such as coastal Ecuador can force transnational actors such as the United Fruit Company to make major changes to their business practices (Striffler 2002). More recently, banana workers sterilized by the nematicide DBCP enrolled the Nicaraguan state in their struggle for compensation from transnational fruit and chemical companies through passage of supportive (albeit largely ineffectual) legislation (Bohme 2015). While it is important not to romanticize such grassroots efforts, they can nevertheless help to balance bleak political economy portrayals of the effects on global forces on health. A scalar lens within political ecologies of global health, as

part of a general sensitivity to discursive dynamics, can therefore open up new possibilities for interventions that do not take for granted the inevitability of either neoliberal globalization or poverty in the global South.

### ***Subjectivities, Affect, Environment and (Global) Health***

As the above scalar political discussion suggests, discursive considerations play a role not only in how ecologically entangled health inequities are experienced, but also in how they are—or could be—confronted. An “emotional political ecology” approach highlights the profoundly *affective* ways in which people experience, embody and react to environmental change (Sultana 2015). Orenses’ emotional reactions to the challenges of export-based banana production reflect their gender, class and age, and their relationships to land, to markets in the global North, and to each other. The influences of political economic and ecological factors on health in El Oro, and responses to them, are mediated by emotions such as anxiety (“*un estrés fatal*”) and hope tied up with surviving and supporting one’s family in a precarious industry. Consistent with such relational dynamics, Nading (2014) characterizes dengue control efforts in urban Nicaragua as a search for better *relationships* between (usually female) frontline control workers, neighbours, the state, researchers from the global North, mosquitoes, and numerous other entities across scales, including both neoliberal and socialist ideologies. The entanglement of such entities holds implications for responses mounted by researchers, communities and social movements—notably the need to intervene in thoughtful ways that are attentive to discourse and affect. How people with different gender, class, ethnic, professional and other forms of identity internalize or challenge narratives linking health, environment, and local and global social worlds, can inform interventions—especially action research, advocacy or solidarity work that is “bottom-up” enough to capitalize on local strengths, while linking up place-based efforts with broader movements (cf. Escobar 2004).

### **Conclusion: Challenges and Prospects**

This paper has illustrated significant opportunities for enhanced attention to political ecology themes, insights, and methods in global health scholarship. These include comprehensive characterization of pathways to health outcomes involving political economic and ecological interactions across scales; attention to discursive features such as scalar narratives stabilizing inequitable power relationships; and appreciation of the emotional dynamics of experiencing and responding to ecologically entangled global health issues. Political ecology is not the only way to understand such issues, as illustrated by the critical social scientific work on global health reviewed earlier, but our case study and discussion has illustrated how political ecology can integrate and augment this existing work. In addition, well established globalization-and-health approaches draw on political economy to characterize the health impacts of neoliberal globalization (Labonté et al. 2011). Latin American “Social Medicine” or “Collective Health” traditions focus on critical processes of “social determination” of health by structural conditions,



foregrounding the emancipatory agency of marginalized groups (Breilh 2008; Spiegel et al. 2015). Ecohealth and One Health researchers have extensively characterized complex environment–health interactions (Dakubo 2013; Wallace et al. 2015). Political ecologists may therefore find considerable resonance between their own approaches and elements already found within global health, elements that they can combine—and problematize—in uniquely comprehensive ways (King 2010).

Such resonances also suggest opportunities for mutual learning. In our characterization of the historical, political economic, and ecological roots of pesticide exposure in El Oro, engagement with epidemiologic evidence (an integral part of global health) prompted caution in our assertions regarding the health effects of such exposures, as well as a broadening from pesticide exposure to include related social determinants of health. This use of epidemiology to complement ethnographic data supports Guthman and Mansfield’s call for political ecologists to understand that many biological processes “are not experienced directly by the individual and so must necessarily be represented in biological science” (2015:560). Of course, epidemiologic and other biomedical scientific findings should not necessarily be taken at face value by political ecologists. Further research into the social production of global health science—from epidemiology and biostatistics, through “qualitative” methods, to laboratory-based bench sciences such as toxicology and microbiology—would operationalize Jackson and Neely’s (2015) call for political ecologists (of health) to understand knowledge as situated, and would likely be strategically useful in engaged scholarship for health equity and environmental justice (cf. Brisbois et al. 2017).

Notwithstanding the discursively problematic implications of biomedicine’s turn to “the global”, furthermore, it does motivate significant human and financial resource commitments to the search for broad patterns, in contrast to political ecology’s tendency to produce numerous insightful case studies (Castree 2010; Galt 2010). Political ecologists may therefore find global health research programs, funding and collaborations that can encourage the “knitting together” of insights from multiple political ecologies of health. Collaborating with epidemiologists, “qualitative” health researchers and health professionals such as physicians and nurses, who frequently display lifelong commitments to improving health and social justice, could enhance the analytic scope and real-world impacts of political ecologies of global health. In addition, the applied or intervention-focused nature of global health (not to mention the research and healthcare funds that support it) may provide opportunities for strengthening the empirical basis and impact of political ecologies of health. For example, Ecohealth projects often employ transdisciplinary teams and collect new data on ecosystem–health interrelationships, while involving communities in action research (Dakubo 2013). The kinds of new ecological and health data and potential for interventions that such projects generate are not often readily available to “lone wolf” political ecologists (Robbins 2012), who are more likely to engage with social theory or ethnographic case studies than with well funded health interventions. Thus while not all political ecology (or global health) need be “useful” in a narrow instrumental sense (Lave 2014; Pigg 2013), engaged

scholarship for environmental justice is one potential benefit of the kinds of analyses we are advocating here.

Attempts to apply political ecology to global health topics may, nevertheless, encounter persistent epistemological barriers in public health science. Schrecker (2013) has questioned whether efforts to achieve equitable health outcomes in the context of globalization can “survive” epidemiology’s narrow vision of what counts as evidence (cf. Adams 2013). Political ecologists must of course not let pressing large-scale inequities rush them into inaccurate scientific claims. We do not advocate an overly cautious approach, however, in which cross-cutting themes evident in multiple empirical analyses are ignored. Many political ecologies of health are refreshing in this respect, with their willingness to name and trace the effects of colonialism, capitalism and processes of neoliberalization (e.g. Richmond et al. 2005; Turshen 1984). Political ecologists and global health researchers are thus faced with a major opportunity, and a pressing need, for collaborative and engaged scholarship to address the ongoing effects of unfair power relations on environmentally linked health outcomes.

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## Endnotes

<sup>1</sup> Additional relevant bodies of literature that we are not able to review here include political ecologies that engage with health, but not with the specific “political ecology of health” literature; and health geography or medical anthropology publications that are authored by political ecologists (as demonstrated by their previous work), but do not explicitly invoke political ecology.

<sup>2</sup> The study was approved by the University of British Columbia’s Behavioural Research Ethics Board.

<sup>3</sup> While data analysis was attentive to such political ecology themes, these linkages were often made directly by interviewees in response to open-ended interview questions, suggesting that political ecologies of health can emerge both deductively and inductively.

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