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Extractivism, Gender, and Disease: An Intersectional Approach to Inequalities*

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Understanding inequalities is a fundamental part of our ethical considerations of international relations, and doing so requires attending to their root causes. Entire fields are devoted to the study of gender disparities, natural resource extractivism, and global health issues, but rarely are these seemingly disparate topics brought together. In this essay, we argue that it is impossible to ethically address inequalities without attending to their multiple dimensions. We use an intersectional approach to analyze the relationship between a country's dependence on resource extraction and the gendered consequences of this dependence on its most marginal populations. Using Ecuador's 2015 chikungunya epidemic in the refinery city of Esmeraldas as a case study, we show how spatialized and feminist perspectives in the analysis of an oil-dependent economy help to identify differentiated health impacts on its population. Extractivism exacerbates the already heavy burden of women's care work, thus forming a central mechanism of the "illness-poverty trap" by which ill health is both a consequence of and a contributor to inequalities.[1]

Ecuador's dependence on oil, which began when oil was first drilled in the country in 1972, is only the most recent iteration of its primary commodity export economy, previously reliant on bananas and coffee. In the last decade, high oil

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prices have brought much-needed income to Ecuador and to other hydrocarbon-dependent countries.[2] In several South American states, this coincided with national-developmental governments that sought to establish "Socialism of the 21st century," increasing public investment in social services and experimenting with new forms of participatory democracy. These political projects depended on raw material exports, in the context of what Maristella Svampa has called the "Commodities Consensus," by which the neoliberal "Washington Consensus" of structural adjustment was replaced by a post-neoliberal consensus based on extractivism.[3]

The oil refinery in Esmeraldas was built just outside the city in 1978, as the nation began its foray into the petroleum economy. Drilling had begun a few years earlier in the country's Amazon region, and the construction of the refinery in the coastal city was emblematic of that period's nationalist developmentalism. Aspirations for an industrialized future with progress, services, and employment brought waves of migration from interior provinces to the port city, just as deforestation by wood extraction in nearby provincial areas was making rural life more difficult. The city of Esmeraldas grew by about 5 percent in the 1970s, almost double the growth rate of the Ecuadorian population as a whole.[4]

During Ecuador's self-proclaimed Citizen Revolution—defined by a sweeping series of popular socialist reforms during the administration of President Rafael Correa from 2007 to 2017—oil exports increased from $8.3 billion in 2007 to $14.1 billion in 2013, yielding more national oil income than ever before.[5] To further capitalize on oil income, beginning in 2008 the Correa government undertook a massive project to recondition the Esmeraldas Refinery—the country's only refinery—to process higher volumes of crude oil. State investments during the oil boom period of 2007–2014 included "social compensation" projects aimed at improving public services and educational centers for local populations living near the oil fields and industrial sites. Yet, as we will see below, the impact of the oil industry has not reduced the inequalities experienced by Esmeraldas's underprivileged populations.

Despite its hopeful promises, the refinery has brought few jobs to the mostly Afro-descendant Ecuadoreans who live in the city. Esmeraldas's historical marginalization has led to a less-educated populace than the national norm and to fewer local professional companies than elsewhere in the country.[6] The refinery works mostly with service companies based outside the city and province, and imports professionals from the national capital of Quito and other regions as technicians

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and managers. A significant portion of Esmeraldas's inhabitants, instead, are involved in informal sector activities.[7]

These characteristics are the context for our examination of the inequalities of extractive economies. To understand the political economy of embodied disparities, we focus on women's indispensable and unpaid care work, which is central to the reproduction of health inequalities. We begin by looking at the ways that Ecuador's extractive economy creates disparities in city spaces and deepens gendered divisions between forms of work, both between formal and informal work and between productive and reproductive labor. The second part of the essay focuses on infectious diseases and health inequalities, showing how the epidemiological development of the country's 2015 chikungunya epidemic reflected, reproduced, and reinforced gender hierarchies produced in the everyday spaces and activities in an oil-dependent economy. Finally, in the third section we look at the intersection of reproductive work and the impact of infectious diseases.

Unpaid Work and Informally Settled Spaces in a Refinery City

Because extractive sites are critical nodes in global commodity chains, people who live in these areas must adapt to intensified labor and consumer markets driven by industry interests. In such local economies, salaried and formal work increases in relative importance and power compared to reproductive work. In the oil and gas sector worldwide, women's employment is "woefully underrepresented."[8] This has an especially important impact on gender relations in all oil-producing countries, and even more so in Ecuador, where only 10 percent of extractive jobs nationally are filled by women.[9] Thus, women's dependence on men increases since men can more readily access formal jobs and regular pay.

Reproductive work, as feminists have argued since the 1970s, is the devalued and unpaid work that is necessary to sustain life: cooking, cleaning, and care work in general. As Mariarosa Dalla Costa and Selma James noted as early as 1972, "salary pays for more work than it appears to,"[10] referring to the unpaid and invisible work that is in fact the "production of all the conditions of production,"[11] particularly the reproduction of waged labor. Seventy-three percent of adults in Esmeraldas with no steady income are women.

Nationally, women spend three and a half times more hours than men on care work activities, such as cooking, cleaning, washing, and caring not only for their

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children but for the elderly and sick, among others. The gap is even greater in Esmeraldas, where there is a higher proportion of female-led households than in any other province, and where women spend 4.2 times more hours than men in unpaid household work. These numbers are hardly surprising, and reflect the devaluation of women's work and care work that we see throughout industrialized societies.[12] Yet there are specific implications of these unequal social structures in sites where the petroleum industry is central to the economy.

Extractive sites are contaminated sites, disproportionately increasing the burden on women. The environmental impact of petrochemical complexes has been extensively documented in studies that detail the direct health impacts of refineries on local populations due to air, land, and water contamination.[13] During the oil boom in the 1970s, migrants to the city of Esmeraldas began to settle informally in areas close to the refinery. Many families built houses within view of the giant steel tanks in which the oil is processed, with heightened health risks for the refinery's closest neighbors. The informally settled neighborhood of 50 Casas, for example, just across the Tiaone River from the refinery, still has unpaved roads haphazardly adapted to existing houses. In the rainy season, residents must wade through mud contaminated by runoff from the refinery on the way to and from their homes. Water, electricity, and sewage only reach these neighborhoods after years of settlement and collective demands, if at all.

Difficulties in accessing basic services in unplanned and untitled neighborhoods, as well as the health impacts of the refinery's contamination, increase women's work as they continue to care for their families.[14] For example, a refinery spill and fire in 1998—one of the worst environmental disasters in the country's history—is remembered by nearby residents in terms of their family members' illnesses, emotional and financial costs, and their continued vulnerability to the dangers of the refinery. As one resident explained, "Most people here are sick in the lungs from contaminated blood because of the refinery smoke. At midnight it is impossible to sleep with the refinery; around that time there is a stench that is unbearable."

As a result of the precarious living conditions created by the extractive industry, women in Esmeraldas bear an increased burden, working longer hours caring for sick, injured, and malnourished family members. When the spread of infectious disease is added to this equation, the disparity between men and women becomes even more pronounced.

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Infectious Diseases and Social Inequalities

Tracing disease transmission in unequal social and spatial systems helps us to better identify the mechanisms of inequalities, in which women's unpaid reproductive work plays a significant role. In their work on disease transmission in urban landscapes, Santos-Vega et al. write, "The complexity of cities relevant to human health results from the multiple interactions between social, economic, and ecological forces acting at different spatial scales."[15] These interactions became evident in 2015, when Esmeraldas became the main locus of a nationwide chikungunya epidemic.

Chikungunya, which only came to the Americas in the last decade, is a dengue-like disease that results in fever and chronic, lingering joint pain that can have a major impact on quality of life.[16] By July 2015 nearly 10,000 of the more than 27,000 Ecuadorian cases of chikungunya were to be found in Esmeraldas. The specific mobility patterns found in the port city have made it a particularly susceptible site for the transmission of such a disease. International travel and trade are important factors in the spread of vector-borne diseases, including dengue, zika, and chikungunya,[17] as transportation hubs and cities are critical transmission sites at the beginning of an epidemic period.[18] Port cities are central nodes in global transportation flows; and the *Aedes aegypti* mosquito, the main vector for all three of these viruses, has been shown to travel and reproduce in ships more than in any other form of transportation. A 2013 study in Iquitos, Peru, found that 72 percent of its sampling sites in large boats were infested with the vector, and 39 percent of sampling sites in medium-sized boats were infested. Large boats "provide suitable mosquito habitats due to dark, damp cargo storage spaces and ample oviposition sites."[19] Thus, the port city of Esmeraldas provides apt conditions for vector propagation; and even after the peak of the epidemic, the province has continued to have the highest number of cases in all of Ecuador.

Aedes aegypti mosquitoes breed in containers that collect water, particularly large water storage containers, such as tanks, barrels, or, increasingly, discarded rubber tires. Additionally, its short flight range of less than one hundred meters means that this type of mosquito is more likely to propagate its virus in urban areas, particularly in areas with poor public services that make water storage necessary.[20] In the Esmeraldas province, more than 40 percent of households do not have access to piped water, and 67 percent are not connected to a public sewage system. This is especially the case in poor unplanned neighborhoods, such as those

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near the refinery installations. Even areas in the city that do have access to the municipal water system must still store water due to the system's unreliability. These conditions, in addition to crowded housing, high population density, and a lack of preventive measures, further increase the possibility of vector propagation and the consequent health risks.

Since the vector reproduces in close proximity to human hosts, biting several humans in the course of a single blood meal, the *Aedes aegypti* can quickly transmit the virus to multiple hosts and propagate the disease more quickly than other vectors. Chikungunya episodes spread rapidly and concentrate around the home, with spatial correlations of those who have contracted the disease clustering at distances of less than 230 meters from the home, as opposed to the more endemic dengue that clusters at greater distances of up to one kilometer.[21] In one neighborhood we studied, we found that nearly all the inhabitants had contracted the disease. These observations are supported by the results of a 2014 epidemiological study of chikungunya in Sri Lanka, where in 71.5 percent of families with at least one chikungunya patient, all family members had the disease.[22]

Because of these spatial characteristics of virus transmission, gender roles are key to helping us understand differentiated risks of vector-borne infectious diseases. Women in Esmeraldas spend an average of over twenty hours a week on domestic chores in the home, compared to fewer than five hours spent by men, which means that women are far more likely to be bitten by the mosquito and infected by the disease. In a study in Bangladesh, scientists found that women were one and a half times more likely to contract chikungunya, which correlates closely with the greater amount of time that women spend at home compared to men. As Henrik Salje, the lead researcher of the Bangladesh study, explains, "It appears that mosquitoes are very lazy . . . . They bite someone in a household . . . and then hang around to bite someone else in the same home or very nearby. The extra time women spend in and around their home means they are at increased risk of getting sick."[23]

Exposure to vectors, then, is an important factor in relative gendered risks for contracting infectious diseases, as this exposure is defined by gender-differentiated activities and spaces. As women are more likely than men to care for sick family members, they are also more likely to be exposed to and have a higher contraction rate of infectious diseases.[24] Thus, it is clear that health risks are not uniform, and that susceptibility to disease depends on specific social relations. In an extractive context, conditions of vulnerability are produced by the structural violence that

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dispossesses marginalized populations of healthy environments. Efforts to address the needs of these populations must therefore consider the intersecting gender, race, and class dimensions of historically constituted, locally experienced, and economically structured health risks.

Linking Extractivism, Gender, and Disease

Having demonstrated the ways that gender-differentiated forms of work in Esmeraldas lead to different exposure rates to infectious disease, we now turn to how these uneven exposure rates exacerbate the social and economic impacts of the extractive site, perpetuating the illness-poverty trap. A city whose spatial-economic logic centers on the petroleum industry heightens demands on informal, unpaid, and reproductive work. In this context, a physically debilitating disease such as chikungunya has an inordinate physical impact on the elderly, on the sick, and on children. Its economic impact is felt most strongly by women and informal workers, whose daily demands and incomes leave little margin for rest and recovery.

In the Kilombo neighborhood, for example, most women who are the heads of their household also work as *morocheras*, street vendors of a hot maize drink. They prepare the drink and fried empanadas with cheese at home, then go into the city center to sell. Whenever they or their family members become ill, they must choose between either providing care at home or going out and earning their daily income. But the consequences of chikungunya are not only physical and economic; the disease also increases the personal sense of marginalization. The subjective connections that these women make between the health impacts of the refinery and the infectious disease can be understood to the extent that both exacerbate their already difficult circumstances.

So accustomed are the inhabitants of neighborhoods near the refinery to the health impacts of its contamination that many believe the chikungunya epidemic must also be one of its consequences. Several residents who we interviewed connected the chikungunya epidemic to a period of testing in the refinery in which especially strong odors emanated from its smokestacks. Recounting the period during which she fell ill with chikungunya, one neighbor exclaimed, "It was terrible! And all the fault of the refinery! It's because there's so much contamination in the air, so much contamination in our blood, that it causes us that pain." Another attributed both skin problems and chikungunya to pollution from the

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refinery: "In my family, we had an itching in our skin, that was an itching illness that everyone got, then everyone also got chikungunya from the toxic gases."

The name chikungunya comes from the Makonde language in eastern Africa, where the virus was first isolated. It means "that which bends up," describing the posture caused by the illness's extreme and chronic joint pain. Among residents in Esmeraldas, the strangeness of the name reflects the uncertainties surrounding the disease. Given the difficulty of accessing healthcare in these areas, most of those who show symptoms do not receive a definitive diagnosis. Thus, "chikungunya" in these contexts becomes a word that describes multiple afflictions, including those caused by structural and environmental violence.

It is significant that the inhabitants attribute chikungunya to the refinery, an industry and complex that is rarely publicly questioned, due in part to its national economic importance and in part to its long and established existence. While not true in the epidemiological sense, there is a deeper truth to the residents' attribution: the refinery has indeed contributed to the spatial and social realities that provide literal breeding grounds for such an epidemic. These realities foster a sense among the inhabitants that both the refinery contamination and diseases such as chikungunya are inevitable, and that so too are the deeply entrenched gender roles and unbalanced burdens borne by women and men. The complex intersectional nature of the problems, which leads to a low sense of self-efficacy in preventing the disease, may negatively affect a community's practices in mitigating the severity of an epidemic: "Feelings of powerlessness [result in] disempowered communities . . . more susceptible to disease."[25]

Conclusion

Public health measures in some cities have been able to decrease—and in one case even eradicate—the *Aedes aegypti* vector, and therefore also the diseases it spreads.[26] The District Health Director of Esmeraldas, however, noted in 2016 that it was "the lack of collaboration between people that influences the expansion of the virus. It is not our responsibility to go into houses to eliminate breeding sites. That is each family's responsibility." Such a perspective does little to recognize the structural violence of the unequal spread and impact of a disease such as chikungunya. Without recognizing the broader socioeconomic and gendered system of inequalities—defined in this case by the extractive context of the city—we cannot understand who is most adversely affected by infectious diseases or how a virus might be connected to the constitution of social inequalities.

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Extractive logics depend on specific exploitations. We have seen above that the economic and health impacts of the refinery in Esmeraldas increase emotional, temporal, and physical demands on devalued informal and reproductive work, primarily carried out by women. Disease extends unevenly over this terrain of differentiated risks and impacts. The mosquitoes are not the only carriers of the disease from body to body. Ill health is also borne among specific marginalized bodies through an economic system's production of vulnerability. The marginalization of women's reproductive work in the extractive context of a refinery city leads to the central role that infectious disease plays in inequitable global development.

While our focus has been on the ways that gendered and health inequalities are articulated in Ecuador's extractive context, our broader point is that social inequalities are multifaceted and work on multiple scales at the same time. We cannot understand or address a specific inequality—be it characterized by conditions of poverty, racial or environmental injustices, or health or gendered disparities—without taking an integral approach that specifies political economic relationships between seemingly disparate dimensions of lived experiences. Our ethical responses to social injustices must also be intersectional.

NOTES

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[3] Maristella Svampa, "Commodities Consensus: Neoextractivism and Enclosure of the Commons in Latin America," *South Atlantic Quarterly* 114, no. 1 (2015), pp. 65–82.

[4] Instituto Nacional de Estadística y Censo (INEC), *Difusión de Resultados Definitivos del VI Censo de Población y V de Vivienda 2001 – Julio 2002* (Quito: INEC, 2002).

[5] Sara Caria and Rafael Domínguez, "Ecuador's Buen Vivir: A New Ideology for Development," *Latin American Perspectives* 43, no. 1 (2016), pp. 18–33.

[6] The average years of schooling of Esmeraldeños is only 7.9; the province ranks 21st out of 24 provinces in average years of schooling; and it ranks 18th in percentage of population completing primary education (37 percent). See Instituto Nacional de Estadística y Censo (INEC), *2010 Census* (Quito: INEC, 2011).

[7] According to the *2010 Census*, of the economically active population in Esmeraldas, 26 percent are self-employed in the informal sector, 20 percent work in private employment, 18 percent are day laborers, 14 percent are civil servants, and 4 percent are domestic workers.

[8] World Petroleum Council and Boston Consulting Group, *Untapped Reserves: Promoting Gender Balance in Oil and Gas* (Boston: Boston Consulting Group, 2017).

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[16] Jelte Elsinga et al., "Community Participation in Mosquito Breeding Site Control: An Interdisciplinary Mixed Methods Study in Curaçao," *Parasites & Vectors* 10 (2017), pp. 434.
[17] Su Hyun Lee et al., "The Effects of Climate Change and Globalization on Mosquito Vectors," *PLoS ONE* 8, no. 7 (2013).
[18] Karmesh D. Sharma et al., "Exploratory Space-Time Analysis of Dengue Incidence in Trinidad: A Retrospective Study Using Travel Hubs as Dispersal Points, 1998–2004," *Parasites & Vectors* 7 (2014), pp. 341.
[19] Sarah Anne Guagliardo et al., "River Boats Contribute to the Regional Spread of the Dengue Vector *Aedes Aegypti* in the Peruvian Amazon," *PLoS Neglected Tropical Diseases* 9, no. 4 (2017).
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Abstract: Social inequalities can only be understood through the interaction of their multiple dimensions. In this essay, we show that the economic and environmental impacts of natural resource extraction exacerbate gendered disparities through the intensification and devaluation of care work. A chikungunya epidemic in the refinery city of Esmeraldas, Ecuador, serves to highlight the embodied and structural violence of unhealthy conditions. Despite its promises of development, the extraction-based economy in Esmeraldas has not increased its vulnerable populations' opportunities. It has, instead, deepened class and gendered hierarchies. In this context, the most severe effects of chikungunya are experienced by women, who bear the burden of social reproduction and sustaining lives under constant threat.

Keywords: extractive economies, care work, gender, health inequalities, structural violence

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