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The Land is Ours.
Vulnerabilization and resistance in informal settlements in Puerto Rico: Lessons from the Caño Martín Peña Community Land Trust

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Abstract

Between 2002 and 2004, residents from seven informal settlements located along the *Caño Martín Peña*, a highly polluted channel in San Juan, Puerto Rico, established a community land trust to regularize land tenure and protect the historically marginalized barrios against the threat of displacement, as an unintended consequence of the ecological restoration of the channel. This article looks at the *Fideicomiso de la Tierra del Caño Martín Peña* (the Caño Martín Peña Community Land Trust or Caño CLT) from a political ecological perspective, as it aims to identify how the interests, policies and discourse of political and economic elites function to perpetuate the vulnerability of residents in unplanned settlements, and how the Caño CLT is an effective instrument to counter this process. The Caño CLT supports on-site rehabilitation by taking land out of a hostile market, reinforcing solidarity networks and democratizing sustainable planning through ongoing participatory planning-action-reflection processes. It is a critical piece of the wider comprehensive development ENLACE Caño Martín Peña Project, whose benefits include reducing the risk of flooding and restoring the environmental qualities of the mangrove channel. The article considers that informal settlements like those in the Martín Peña area are often located in a city's most environmentally vulnerable, yet ecologically and geographically valuable areas, prone to land grabs after disasters. By looking at public discourse in Puerto Rico and the U.S. in the aftermath of the devastating hurricanes that struck the island in 2017, we analyze the assumed links between informality and vulnerability and how these assumptions are used to spur public support for displacements. The article argues that documenting and

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theorizing the knowledges produced by the enduring resistance of the Martín Peña communities can support residents in unplanned settlements in the Global South to come together and create mechanisms that protect land and counter vulnerabilization.

Keywords

ommunity Land Trusts, informal settlements, political ecology, vulnerability, land rights.

"In Puerto Rico you had a big curtain, hiding everything. And Hurricane María took care of that. So the people could see what was really happening on our island (UNC, 2018)."
–José Caraballo Pagán, Caño Martín Peña resident

Introduction

Puerto Rico, a non-incorporated territory of the U.S., has been in a severe economic crisis since 2006, facing an unaudited public debt of USD $74 billion. The situation worsened after Hurricanes Irma and María hit in September 2017. Thousands of people died in the aftermath, mainly due to the lack of electricity, communication, food and clean water. Different Puerto Rican activist groups are advocating transitions to other societal models to move away from what caused these crises. The case of the barrios along the Martin Peña estuarine tidal channel (*caño* in Spanish), located at the heart of the San Juan Metropolitan Area, presents an example of such an alternative approach. For decades, residents have struggled for community land ownership, the right to the city in decent, equitable conditions, and environmental justice. These communities are among many that were established 'informally' –that is without formal ownership of the land, without building permits or without following building codes– on ecologically vulnerable public lands along the Martín Peña channel. During the process of modern industrialization in the 1930's and 1940's, impoverished peasants migrated mainly to San Juan, the capital of Puerto Rico, and built makeshift wooden and tin homes on the wetlands along the channel, using debris and vegetation as fill materials. As time passed, residents went through on-site rehabilitation, land regularization through individual land titling, and the implementation of several housing policies that eventually led to evictions and the displacement of half of the settlements.

In the early 2000's, thousands of residents participated in the planning-action-reflection process that led to the establishment of the first Community Land Trust (CLT) in an informal settlement in Latin America and the Caribbean. The *Fideicomiso de la Tierra del Caño Martín Peña* (the Caño Martín Peña Community Land Trust; hereafter *the Caño CLT*) is an instrument to regularize land tenure through collective land ownership and individual surface rights. It was conceived to avoid gentrification under the assumption that once the channel is dredged –a demand of the surrounding communities– several inland lagoons and channels would be reconnected, and thus the privileged location of the communities would attract developers and land values would increase. Different from individual land titles, with the Caño CLT the land can never be sold, protecting the communities for generations to come from involuntary displacements, such as those that could occur as an unintended consequence of the urban reform and ecosystem restoration project that residents have been fighting for to improve

living conditions. The Caño CLT has been internationally recognized by a World Habitat Award for its potential to inspire other land rights struggles.

This article describes how the economic crisis in Puerto Rico and the aftermath of Hurricanes Irma and María have led to massive migration to the United States, lowered land prices, and how poor communities are becoming a target for displacement due to policies that highlight their vulnerability to disasters and discard the potential for on-site risk mitigation and equitable recovery. For the Government of Puerto Rico, regularizing land tenure has become a priority. Nevertheless, it is well known that individual land titles will expose informal settlements in privileged locations to a hostile real estate market that might lead to displacement. We argue that, although designed to protect informal settlements from increases in land value, the Caño CLT is also effective against displacement in the current landscape. The Caño Martín Peña communities (hereafter *the Caño communities*) are located in one of the city's most ecologically and geographically valuable, yet environmentally vulnerable areas. These areas are the most in need after disasters, but because of the value of their location, they become prone to land grabs and other forms of disaster capitalism, thereby supporting the continued vulnerabilization of informal communities. We argue that the Caño CLT and the wider ENLACE Caño Martín Peña Project provide a counter mechanism to this, by taking the land out of a hostile market, strengthening their communities through on-site rehabilitation and equitable, just recovery, reducing the risk of flooding and restoring the environmental qualities of the mangrove channel. Moreover, reinforcing solidarity networks, democratizing sustainable planning processes and garnering political power will be key to counter disaster recovery housing policies that promote displacement.

The article is organized into three sections. First, we introduce the Caño CLT, how it was created and how it functions. Then we describe the disaster capitalism that followed Hurricane María, how the policies to address the financial and climate crises can lead to displacement and how the Caño communities have responded. In the final section, we use literature on political ecology to consider the knowledges of the Caño communities and why they can help other resistances worldwide.

The authors of this article have been involved directly from academic and professional perspectives, collaborating with the community leadership and helping in the development and advancement of the instruments created by them to attain their collective goals. Together with the community leadership and supporters we conduct ongoing long-term action research. After Hurricane María, continuous exchanges with community leadership and with staff of the ENLACE Caño Martín Peña Project Corporation through meetings and direct conversations have provided valuable information on how they have grown to a next level, facing the most pressing priorities imposed by the emergency, like repairing, building and providing roofs for the most vulnerable residents, while at the same time they continue focused on their mission remaining on the solid foothold created within the communities, the Caño CLT. This article is based on those constant exchanges. In addition, it is based on in-depth unstructured and semi-structured interviews with community leaders and members

of the CLT before and after Hurricanes Irma and María, as well as discourse analysis of government and media discourse on housing informality following the hurricanes.

1. Creation of the Caño Martín Peña Community Land Trust

Puerto Rico's rapid industrialization process led to the establishment of unplanned communities in coastal cities across the island. In the developmental discourse of the succeeding governments, these settlements were declared unfit for human habitation and portrayed as a threat to health, security and wellbeing of all citizens of Puerto Rico. The Puerto Rico Eradication of Slums Act of 1945 spurred support for clearances, sponsored by U.S. federal government, which only resulted in the relocation of clusters of poverty to other areas. Many families were forced to move to public housing projects, but as the government would not provide housing for everyone, the existence of informal settlements was mostly tolerated.

Today, thousands of people still live in these communities. Approximately 25,000 people live in the Caño area, in eight communities located along the Martín Peña tidal channel. Paved roads, electricity and running water are now available, but most homes still lack proper storm water drainage and a sanitary sewage system, and sewage still flows directly into the channel. The channel is blocked and frequent floods with contaminated water affects 70 percent of the communities. A strong sense of attachment to the land, persistent deprivation and fear of displacement led the residents of seven of the eight Martín Peña communities to create the Caño Martín Peña CLT as a practical solution to address structural problems that reproduce poverty and marginalization.

Due to its national significance, the U.S. Environmental Protection Agency (EPA) chose the San Juan Bay Estuary, where the channel is located, to become part of its National Estuary Program. The San Juan Bay Estuary Comprehensive Conservation Management plan, adopted in the late 1990's, included the dredging of the environmentally degraded Caño Martín Peña and addressing infrastructure challenges in the adjacent communities as the main actions required to uplift the ecosystem. In the early 2000's, the Government of Puerto Rico converted the dredging into a strategic project and assigned it to the Puerto Rico Highway and Transportation Authority (PRHTA), a public corporation under the Department of Transportation and Public Works.

Employees of PRHTA took a completely different approach to the involvement of the communities along the tidal channel (Algoed, Hernández Torrales, Rodríguez Del Valle, 2018: 13). The team, initially composed of planners and community social workers, implemented a methodology that was new to the PRHTA. Rather than reducing citizen participation to public hearings after the planning stage of a project is almost finalized, they assembled the community leadership, helped strengthen grassroots organizing, and started planning not only the dredging of the channel, but rather the comprehensive development of the affected communities. Residents were invited to think critically about their living conditions and started conveying their distrust in government in relation to the displacement of families to public housing. They questioned who the beneficiaries of the proposed

strategic infrastructure project would be, and whether it would lead to further displacements, knowing the value of their centrally located lands. They expressed their strong desire to remain in the community, as well as their fear of displacements.

The communities embarked upon a comprehensive planning, action and reflection process, that during the first two years included organizing more than 700 community meetings and outreach activities. This process transformed the infrastructure project into a comprehensive development project known as *Proyecto ENLACE del Caño Martín Peña* (ENLACE Project). Building trust between the Authority's personnel and the community, fundamental to fostering participation, took time. The leadership of the communities created the grassroots nonprofit organization, the Group of the Eight Communities Along the Caño Martín Peña, Inc. (G-8), which brought together all the grassroots organizations. The dialogue among communities led to a greater understanding of the problems they had in common, rather than the differences. As Juanita Otero, one of the community leaders involved in the process from the beginning, described it:

> "The greatest achievement is for the eight communities to speak the same language. We were close physically and, despite having so many things in common, we were not working together. Now we can support each other." (Hernández Torrales, 2007: 794).

The participatory planning process resulted in several instruments, designed from the bottom up. The first was a Comprehensive Development and Land Use Plan for the Caño Martín Peña Special Planning District (District Plan), conceived with the residents of the communities, which envisioned "a united, safe and prosperous community, model of coexistence in the heart of San Juan." The District Plan contains strategies to tackle the conditions of marginalization and integrate the communities with the rest of the city, to rehabilitate the channel and provide infrastructure with the least possible number of relocations, provide rehousing options for affected families within their communities, and ensure that public and private investment in the area is channeled to community businesses to strengthen the neighborhood economy.

The process also led to a new legislation: Law 489, enacted by the Government of Puerto Rico on September 24, 2004. As the electoral process of 2004 approached, community leaders expressed their concern that, with a change of government, the work would be lost. With the support of lawyers and external advisors, and learning from prior experiences, a bill was prepared and discussed extensively to ensure that it was consistent with the decisions made by the communities. After significant community lobbying and strategizing, the bill was finally passed into law. The law recognized the G-8 as the representative entity of the Caño communities. It also created two additional instruments that were to promote equitable, participatory, and sustainable development in the area. The first one is the *Corporación del Proyecto ENLACE del Caño Martín Peña* (ENLACE Caño Martín Peña Project Corporation), a public corporation with the mandate to implement the District Plan, with government resources assigned for a limited period of 20 to 25 years, with the participation of residents and in partnership with public and private sectors. The Board of Directors of ENLACE was designed by the community, ensuring the continuity of the ENLACE Project in spite of changes in government. ENLACE's design effectively placed

governmental instruments and resources in the hands of the community (Figure 1). It achieved the democratization of planning for social and ecological sustainability.

Finally, the Law also created the *Fideicomiso de la Tierra del Caño Martín Peña* or Caño CLT. The ownership of the land on which the communities had lived for over 70 years, previously in ownership of different public agencies, was transferred, first to ENLACE and, then, to the Caño CLT. The land was kept out of the real estate market in perpetuity.

Previously, community land trusts were mostly found in the U.S. and in European countries, where they tackle the growing lack of affordable housing in cities with rising housing costs by taking land out of the market and putting it into nonprofit trusts for collective land ownership. More recently, CLTs are being created in the Global South as a tool to regularize land tenure and mitigate the historical causes of poverty, and the Caño CLT is leading as an example. The community land trusts movement, as it is known today, is described by CLT practitioner and scholar John E. Davis (2010: 3) as profoundly "rooted in a fertile seedbed of theoretical ideas, political movements, and social experiments that had been laid down over a span of many decades." The model as implemented in the U.S. is distinguished by three clusters of characteristics: ownership, organization and operation. In this approach, land is treated as a common heritage, not as an individual possession; land is permanently taken out of the market; individual owners own all structural improvements (the houses and other buildings) separately from the land; and a long-term ground lease gives the owners of the structures the exclusive use of the land beneath their buildings. When we delve into these characteristics, we can find an ethic of stewardship defined as "land treated as a common heritage: encouraging ownership only by those who are willing to live on the land and to use the land, not accumulating more than they need; emphasizing right use and smart development; capturing socially created gains in the value of land for the common good" (Davis, 2010: 4).

Figure 1

"…And for the first time we the residents became actors of our future." Members of the Caño CLT in front of one of the murals in the area.
Source: Authors

The Caño CLT was inspired by the principles of U.S. CLTs, but the instrument was recreated by residents to serve their particular needs, adding their own legal figures, such as surface rights, which we will describe below. Community organizing processes that promote critical and autonomous thinking, the equitable exchange of knowledge and popular education techniques resulted in residents designing their own CLT, and thus, fully owning it.

1.1 How the Caño CLT works

Today, the Caño CLT gives almost 2,000 low-income families collective land ownership of 78 hectares of land in a privileged area of San Juan (Figure 2). The deliberative process of selecting and adapting this new land tenure mechanism in Puerto Rico deepened community cohesion and brought the communities together to protect the land their parents and grandparents "created" (by filling it with debris) (Fuller Marvel, 2008: 112), as well as restore the environmental qualities of the tidal channel.

The Caño CLT regularizes land tenure within the Caño Martín Peña Special Planning District, ensuring permanently affordable housing and preventing involuntary displacement and gentrification as an unintended result of the much needed Caño Martín Peña Ecosystem Restoration Project. The CLT is a nonprofit organization governed by a majority of community residents. The Board is comprised of eleven trustees, six of which are residents from the Special Planning District communities appointed by the Caño CLT member assembly or the G-8, and two others are selected by the board. The other three trustees are representatives of the state and local governments (one from the board of directors of ENLACE, one appointed by the governor and one appointed by the mayor of San Juan). The composition of this board was designed by the residents and it allows the community to maintain control of the land and the assets that were transferred to the Caño CLT via legislation or later acquired. The trustees establish the administrative policy of the CLT and ensure that land serves the best interest of both the larger community and the households who live on the CLT's land, especially those who have to be relocated as part of the implementation of the District Plan. This board of trustees is accountable to the Caño CLT's membership comprised of those individuals and families living on the collectively owned land (the beneficiaries). The assembly of members collectively makes important decisions about the land and other assets. No land within the Special Planning District can be encumbered without the expressed consent of the assembly.

The relationship between the collective landowner and the individual homeowners is regularized via the conveyance of surface rights. This right to use the plot of the land where the home is located is confirmed and evidenced through a notary deed that is executed between the Caño CLT and each homeowner and recorded as a property separate from the land with the Rico Property and Real Estate Registry. The content of the deed is fully transparent, and all the terms and conditions are discussed and revisited during the signing process. The surface rights deed recognizes the separate individual property of the structural improvements (i.e. the house). For the first time, the homeowner will see their house –often built by the family throughout several decades, but never legally owned–recorded officially

under their name within the government records. By regularizing land tenure, residents also gain access to other legal protections available in Puerto Rico. For example, in the surface right deed the homeowner can claim the protection of the family home against non-mortgage related debt claims.

Surface rights can be inherited, sold, and mortgaged, giving families formal access to this type of credit. The Caño CLT, however, retains the first right of refusal. Similar to the U.S. CLTs, when the Caño CLT sells a surface right or a housing unit it owns, and particularly when such property was developed with subsidies, the deed also includes a resale formula that limits equity. As another important and fair component of the terms and conditions included in the surface rights deed, the resale formula ensures that subsidies invested in developing the housing unit last longer, secures a fair return on the seller's investment and creates the opportunity for another low-income family or individual to enjoy adequate affordable housing in the city (Algoed, Hernández Torrales, Rodríguez Del Valle, 2018: 24).

Through the Caño CLT, the residents of the Special Planning District are now among the largest landowners in San Juan. The G-8, as the institutional expression of the organized Caño communities, has garnered a strong voice able to influence politics. During election campaigns, for example, the G-8 invites political candidates to sign an agreement with the commitments made to advance the implementation of the Comprehensive Development Plan, including the ecosystem restoration of the Martín Peña tidal channel and other critical housing and infrastructure works. Such commitments are published, and compliance is reported in the G-8 newspaper *Raíces* ('Roots' in English).

Figure 2

Location of the Caño Martín Peña Special District in San Juan, the evolution of the Martín Peña tidal channel and the proposed dredging. **Source: Corporación del Proyecto ENLACE del Caño Martín Peña**

2. Hurricane María, disaster capitalism and the response of the Caño Martín Peña residents

Hurricane María was the most destructive disaster in a century in Puerto Rico. It is estimated that at least 2,975 people died. Regardless, many political leaders and economic elites have described the hurricanes as a unique opportunity to restructure Puerto Rico. "It's a tough time, but it's also an opportunity to start anew, to execute proper reforms–like energy reform, regulation reforms, tax reform, education reform, and health care reforms," Governor Rosselló stated (O'Leary and Chiriguayo, 2018). While dealing with the recovery process, the government has been pushing through an agenda of drastic social and economic reforms that were planned prior to the hurricanes, mostly as part of the austerity measures to address the massive public debt. Overwhelmed, Puerto Ricans still recovering from the effects of Irma and María and trying to rebuild their lives are also dealing with school closures, changes in the government pension system and labor laws, limited access to health care, among others.

Puerto Rico has become a textbook example of 'disaster capitalism', in which collective trauma is exploited to implement, more rapidly, extreme austerity and structural reforms that were already planned before the disaster. It also embodies what Mutter (2015: 158-159) discusses: "natural disasters make the rich richer and the poor even poorer." Disasters and the influx of money that follow are a temptation for many in power. It is a situation that is ripe for manipulation for social, political and financial gains.

The unprecedented economic crisis of the last decade, a disaster for most, has equally become an opportunity for a small group of people who benefit from crises. Puerto Rican debt became a highly profitable asset to invest in. The U.S. imposed and non-elected Financial Oversight and Management Board, through the Puerto Rico Oversight Management and Economic Stability Act (PROMESA), put an end to the country's already fragile fiscal autonomy. Supported by the territorial clause of the U.S. Constitution, the Board has the power to decide over the country's financial planning, laws, budget and regulations to be imposed on the population to repay bondholders, a significant proportion being vulture funds, i.e. funds that invest in debt that is considered very weak and risky. Puerto Rico's USD $74+ billion public debt has never been audited and few Puerto Ricans can identify with the discourse of having lived beyond their means.

Only a crisis –actual or perceived– produces real change, according to Milton Friedman (Klein, 2007: 20). The Government of Puerto Rico and the Fiscal Oversight Board are indeed using these economic and climate crises to produce real change through a complete restructuring of society, by selling off public assets and installing brutal austerity.

Desperate to improve their conditions, an estimated 400,000 Puerto Ricans left the island between October 2017 and February 2018 (Echenique and Melgar, 2018), on top of the estimated 500,000 Puerto Ricans that had already left before the hurricanes since the economic crisis started in 2006 (IEPR, 2016). Simultaneously, the Government of Puerto Rico is attracting wealthy foreigners to relocate to the island with a 4 percent corporate tax approved in 2012, as opposed to the 21 percent corporate tax that they would pay in the U.S.

These tax exemptions do not apply to Puerto Ricans already living on the island. Puerto Rico is experiencing a population swap that is in line with earlier policies of poverty deconcentration at the start of the 20th Century, when it was said that there are too many poor people in Puerto Rico and that it needs more "men with capital, energy and enterprise" (Whalen, 2005: 7). As Oliver-Smith (2005: 58) puts it: "What nature has started, the government would finish."

2.1 The response of the Caño communities to the hurricane

On September 20, 2017, two weeks after Hurricane Irma, Hurricane María took its toll in Puerto Rico. In the Caño area, over 75 families were left homeless, approximately 1,200 roofs lost or severely damaged, and 70 percent of the community land flooded with contaminated water. Nonetheless, the organized community, their collaborators and in total more than 700 volunteers responded swiftly to assess the damages and provided first aid and relief. The grassroots organizing, and a strong institutional framework comprised by the G-8 and its member organizations, ENLACE and the Caño CLT, facilitated recovery in the area.

The lack of electricity and communications led many residents to leave Puerto Rico and find support with families in the U.S. Some of these families and individuals were denied individual assistance by FEMA and instead urged to abandon the island as part of their relief policies. But the largest part of the community residents had the chance to stay and start anew. The communities responded immediately to the crisis situation, knowing that waiting for government for help would take too long. In the month after María, 800+ tarps were delivered by the U.S. Army Corps and distributed by ENLACE, families had access to food, water, medical care, and even cash. Vegetative material and debris was collected, and kits to address the mosquito and rat plagues were distributed. Residents became actors instead of disaster victims, which according to Oliver-Smith (2005: 53) is essential for communities to recover after catastrophes. Together with donations from local and U.S. foundations, over 45 new partnerships, and 700+ external volunteers contributed to the effort. The G-8 selected the most vulnerable residents to help with the construction of permanent roofs, an ongoing activity as this article is being written. With assistance from professional organizations, three model resistant homes will be built.

The Caño communities have been pointing out that implementing the District Plan is key to reducing flood risks in the District and the San Juan Metropolitan Area, and that the ENLACE Project has the potential of becoming an example of just, equitable, and participatory recovery. Although included in the Government of Puerto Rico's request for Federal assistance, the USD $215M Ecosystem Restoration of the Caño was not chosen among the projects to be funded with the $15B in recovery funds assigned to the U.S. Army Corps of Engineers under the Bipartisan Budget Act of 2018 (BBA). The U.S. Department of Housing and Urban Development (HUD) allocated $20B in Community Development Block Grant - Disaster Recovery (CDBG-DR) funds to Puerto Rico, whose use will be determined by the Government of Puerto Rico as per HUD regulations. Such funds present

an opportunity to fully fund the main aspects of the District Plan. However, the Action Plan presented for the first $8.3B lays out strategies that promote displacement of vulnerable communities, even where on-site risk mitigation is feasible. For example, the housing strategy focuses on providing individual families options to relocate outside the floodplain and prohibits reconstruction and rehabilitation within the floodplain. In communities such as Martin Peña, where flood reduction is feasible, denying the possibility to build in the current floodplain above the flood level can have the effect to displace families in need. As both the governor and the housing secretary have recently expressed, the new public policy about communities in sensitive areas is "*se acabó el ay bendito*" (good will is over). However, it seems that this policy will only target low-income communities, as on-site reconstruction is available to others that can afford it. Despite all the efforts of Caño residents to stop displacements from their communities, the damage to homes is being used by the government to incite residents to move to other locations. The Caño CLT is watching this very closely to make sure that the residents may stay put safely on their land, relocating families only when needed and within the community, and with the support needed to overcome future extreme natural events.

3. A political ecological approach to the vulnerabilization of informal communities

Literature on political ecology can help us understand the vulnerabilization of informal communities and the ways in which the Caño CLT provides a counter mechanism to this vulnerabilization. Of specific use to this argument is literature on urban political ecology, which Swyngedouw and Heynen (2003: 914) describe as a combination of the concerns of ecology with those of political economy, and "provides an integrated and relational approach that helps untangle the interconnected economic, political, social and ecological processes that together go to form highly uneven and deeply unjust urban landscapes." In this regard, vulnerability is a thoroughly political ecological concept, as it is not an inherent property of social groups or individuals (Hilhorst and Bankoff, 2003: 5), but, according to Oliver Smith (2003: 10), deeply embedded in complex social relations and processes. Vulnerability, for him, "is the conceptual nexus that links the relationship that people have with their environment to social forces and institutions and the cultural values that sustain or contest them." Rather than speaking about vulnerability as a fixed condition, we speak here about the *vulnerabilization* of informal settlements, because it better denotes how these communities are *made and kept* vulnerable.

When we speak about housing informality, we refer to those homes that have been self-built, without ownership over the land, without building permits or without following building codes, which is how the Government of Puerto Rico (2018: 52) defines informal housing. As to the term 'community', used repeatedly in this article and problematized in literature on the commons, we follow Oliver-Smith's thinking (2005: 54): a community is, in no way, a homogeneous group of people without differences, but rather "a group of interacting people who have something in common with one another, sharing similar understandings, values, life practices, histories, and identities within a certain framework of

variation," or in the case of the Caño communities, people who share a highly politicized geographical living area.

In what follows, we will analyze how vulnerabilization happens in the housing sector. First, we will look at Puerto Rico's official discourse on housing informality, after which we will examine concepts of political ecology to draw lessons on how the Caño CLT counters this discourse.

Hurricane María exposed the profound weaknesses of many of Puerto Rico's sectors, but especially its housing policies. At least one third of about 1.2 million occupied homes on the island were destroyed or suffered significant damage (Woellert, 2017). Additionally, roughly one third of homeowners risk foreclosures (Goldstein, 2017). More than anything, the hurricane brought to the fore the magnitude of the island's housing informality. A study commissioned by the Puerto Rico Builders Association estimated that 55 percent of residential and commercial construction was built informally (Government of Puerto Rico, 2018). The exact number of informally built housing remains unclear, but even in conservative estimates it is widespread.

What is undebatable is that informality in Puerto Rico has been disregarded for decades. But now that, after María, residents are asked to prove property ownership to be eligible for repair grants from FEMA, the country is forced to face the situation of informality; 60 percent of FEMA applicants were initially found ineligible (Florido, 2018). Eventually, FEMA loosened its criteria and started –intermittently– helping owners, renters and occupants of informal homes who could prove residency.

3.1 Public discourse on housing informality

The Government of Puerto Rico is determined to use Hurricane María as an 'opportunity' to tackle the issue of housing informality. We argue that this discourse of political and economic elites discredits informal settlements and reinforces –not reduces– the vulnerability of low-income people who live in these communities, and thus supports their vulnerabilization. In what follows, we discuss in what ways informality has been discussed in Puerto Rico and U.S. public discourse, following Hurricane María.

In the first place, informality is often portrayed as a *choice*. For example, the use of the word 'illegal' to describe informality (mostly referring to poor people and ignoring similar practices by other sectors of society), implies that people may have had a choice to build without permissions (and thus not officially building according to codes) or without the ownership of the land, as a way to 'illegally' avoid costs (see for example Woellert, 2017). It is often said that people take regulations lightly and build wherever they can, without looking much further. If they had looked further, this suggests, they would have been able to opt out of –to choose not to live in– informality. This sentiment is to be found in popular discourse as well. Consider the words of a taxi driver we spoke to in April 2018 in San Juan, representative of many other similar conversations in the past few years: "People put their little houses wherever they want, and they don't think about it. And now nobody can help

them." Even though there may be cases where building without ownership of the land was a choice, most informality results rather from necessity and a lack of 'formal' alternatives.

In the second place, we notice how the hurricane, the disaster relief funds, and the aftermath crises such as the foreclosures and mass migration are presented as an *opportunity* to eliminate informality and move residents out of their communities. When asked what solution he saw for those living in informality, the Governor of Puerto Rico said in an interview (O'Leary and Chiriguayo, 2018) that residents in informal housing will simply have to move out:

> "It's time to go, you know, it's not safe, it's not if, but when, another catastrophic event is going to happen, and it's just not worth it, and we do have the opportunity to use these funds effectively and transparently, why not take this opportunity to make this transition."

And:

> "One of the opportunities I think we have is to start eradicating that informal housing component, [to] start pushing folks into safe, formal [home] ownership. [...] We have had a significant decrease in population in the last couple of decades, and that has led itself to a lot of houses to be available or owned by the bank. [...] Make sure we are ready for another category 5 hurricane."

Even in the Caño communities, despite all the efforts of the Caño CLT, damage to homes and out-migration are being used as an excuse to pressure residents to move to other areas. This discourse and its corresponding policies remind us of the Puerto Rican government rhetoric in the 1950's, briefly discussed earlier in this article, when the Eradication of Slums Act aimed to rid the country of the slums. In the words of the president of the Puerto Rico Housing Authority in 1955, informal settlements are depicted as "almost an endemic abomination, like hookworm had been, which today has been eradicated by the iron will of men of science and government (Esterrich, 2013: 14)." Or in the 1956 newsreel *Puerto Rico Elimina El Arrabal*:

> "Each house that is moved or burnt down is another family taken away from the slums and turned into free citizens of peace and order, worthy of enjoying a true democratic life. And do not forget the slum is a pustule that threatens our entire social body (Viguié, 1950, *own translation*)."

Here, in the third place, housing informality is presented not only as unsafe for residents themselves, but also as a *threat to the social stability* of the country. Today's discourse, again, blames informality for the vulnerability of the country. The coordinator of FEMA in Puerto Rico at the time of Hurricane María suggested that informal construction was to blame for the disaster that the hurricane caused, by saying that to reduce the risks:

> "We need to renew the building codes and eliminate informal construction. [...] We have to forget about the *¡ay bendito!* and reinforce building codes because we don't want to go through another María (Sin Comillas, 2018)."

Also, a Politico article (Woellert, 2017) mentions that "Squatters living on property without deeds are straining an already fragile infrastructure system throughout the island." 'Squatters' –the poorest people on the island– are blamed for the fragility of the country. Indeed, the

damage caused to the housing stock was concentrated in those homes that were built informally: 98 percent of 'formal' housing suffered no or only slight damage (Sin Comillas, 2018). Informal housing is, as one would expect, built with less capital, and informal dwellers usually have no hazard or flood insurances against disaster damage. But putting all the blame on informal dwellers is simply too reductionist. Also, informality in Puerto Rico is so widespread that policies need to be adapted to that reality. The classic slum eradication policy of moving poverty from one place to another, as proposed once again by the government, will not work precisely because of this magnitude of informality.

Lastly, in the discourse today, housing informality is presented as *unsustainable*, and its residents are depicted as too vulnerable to resist new disasters (see for example the Governor's quotes on the previous page), and therefore need to be moved to other locations. Indeed, as we have discussed, informal communities are often located in a city's most vulnerable areas, while at the same time these areas are ecologically very important, and economically highly valuable. An example to draw comparisons is the situation in the favelas of Rio de Janeiro, some of which are located in the areas with the most spectacular views of the city's landscape, with plots being sold for ever higher prices. The Caño communities are also strategically located within the San Juan Bay Estuary and have a high potential for tourism development.

3.2 Politics of unsustainability and informal settlements

In the context of more frequent climate change-induced disasters, it seems therefore urgent to ask fundamental questions on what is sustainable –or unsustainable– specifically in relation to urban informal settlements, and to examine the assumed links between informality and vulnerability. It is assumed, for example, when depicting housing informality as a *choice*, as a *threat to the country*, or as *unsustainable*, that it is this type of urbanization that makes people vulnerable, and that residents in informal housing are to blame themselves for their own vulnerability. But, clearly, it is not this type of urbanization that most contaminates the environment, while informal dwellers must endure most of the impact of environmental degradation. It is also not only informal settlements that are vulnerable. In Puerto Rico, there are many middle and higher income neighborhoods that are located too close to the sea and other bodies of water, resulting often in erosion or regular flooding. Equally, it is assumed that informal dwellers, such as those who settled on the wetlands of the Martín Peña channel, have contaminated this ecologically valuable area, with the debris they used to fill the land and the wastewater that is discarded in the channel due to the lack of a sewage system. But putting the blame on residents who live in these conditions for their own vulnerability is vastly insufficient, because it does not address the broader causes of environmental degradation, nor those of the establishment of informal settlements.

The structural causes of climate change, and the structural causes of vulnerability, can be found instead in precisely those practices that also produce informality, pushing people to the city and, once in the city, pushing them into informal communities. Examples of those practices are the many ways that deregulation of environmental standards in favor of urban

development purposes are promoted, especially now that the financial crisis and the crisis following the hurricane is used as an *opportunity* to further deregulate these standards. The sole aim of this deregulation is to attract investment, putting the economy before well-being of the people and the protection of the environment. Consider the many historical and contemporary examples of extractivism, mostly but not only in the Global South, contributing to climate change and the establishment of informal settlements by people who are pushed out of their valuable areas.

Ingelford Blühdorn (2013) calls this mode of governance 'politics of unsustainability'. This term can be useful when looking at the assumed link between vulnerability and informality. For Blühdorn, politics of unsustainability are those politics that merely manage the social and ecological consequences of unsustainability, rather than trying to tackle its causes. He says: "Rather than trying to suspend or even reverse the prevailing logic of unsustainability, its main preoccupation is to promote societal adaptation and resilience to sustained unsustainability" (Blühdorn, 2013: 21). Resilience, indeed, is a word that Caño residents associate with being ignored.

Hurricane María killed thousands of people, many of whom died because of the lack of power, clean water and decent food. Rather than rebuilding the country so that it can withstand a future natural disaster, with democratically and locally managed renewable energy and food production systems, as well as increased environmental standards, the government has decided to sustain the unsustainable –"however self-destructive it is now widely acknowledged to be, ecologically, economically, socially, and also for democracy" (Wilson and Swyngedouw, 2014, quoted in Blühdorn, 2016: 260).

Puerto Rico's many informal settlements face infrahuman conditions. Its residents are told that they themselves are to blame for wanting to remain in their communities and that, therefore, they will have to show resilience and adaptability, while their conditions are kept the same.

3.3 Knowledges from the Caño communities

The experience of the Caño communities allows us to understand the democratization of planning for sustainability measures, which help to mitigate vulnerabilization in a context of climate change-induced extreme natural events. As described above, the Caño CLT is the result of an extensive and ongoing process of grassroots planning, with the aim to democratize neighborhood development and achieve environmental justice and ecological sustainability. This process is led by the critical thinking of residents, who are encouraged and assisted by professionals to not accept their current living conditions and come up with alternatives. Along those lines, political ecology, as defined by Robbins (2012: 99), "seeks to expose flaws in dominant approaches to the environment favored by corporate, state, and international authorities, working to demonstrate the undesirable impacts of policies and market conditions, especially from the point of view of local people, marginal groups, and vulnerable populations."

Studying the resistance of the Caño communities from a political ecology lens helps us understand the role of critical thinking in social transformation. The Latin American political ecologist Arturo Escobar, studying that role, considers two key tendencies in critical thinking in Latin America: autonomous thinking –*autonomismo*– and *el pensamiento de la tierra,* the thinking of the land (2017: 58-64). In the *autonomismo* tendency, according to Escobar, the communal predominates over the individual, the connection with the land predominates over the separation between humans and nature, and *el buen vivir* (living well in harmony with nature) outweighs economic growth. *Autonomismo* in Puerto Rico is thinking in other directions than those imposed by the colonial capitalist state. This is essential in the Caño CLT and is strengthened every day through collective land management and stewardship. The other key tendency in critical thinking in Latin America, according to Escobar, requires listening to the land. In these processes, residents, and those accompanying and studying them, are required to learn to think and feel –*sentipensar*– with the land, while unlearning our fixation with the individual, private property, growth of the economy, science and the market. Escobar argues that the knowledges connected with the struggles of those who think-feel with the land, are more appropriate in the study of social transformation than many of the forms of knowledge produced within the academy at present (Escobar, 2016: 24).

These struggles provide us with insight into the profound cultural and ecological transitions needed to tackle the environmental crises and reverse the politics of unsustainability. For Escobar (2016: 14), those who produce these knowledges "*sentipiensan con la tierra* (think-feel with the land) and orient themselves towards that moment when humans and the planet can finally come to co-exist in mutually enhancing manners." Residents in the Caño communities think-feel with the land they have created, and with their body of water for whose protection they fight. Consider, for example, the words of Caño resident José Caraballo Pagán:

> "Waterways are living things. It doesn't talk, it doesn't walk, but it flows, it has a life. It grows. And when you've lived next to a thing that you saw as a young person, with a life of its own, to see it just die out, it affects your mind (UNC, 2018)."

Studying the knowledges produced by the struggles of the Caño communities to protect the land and restore the channel in an urban context can help us understand how social transformation in informal settlements can happen. The resistance of the Caño communities provides an antidote for informality by collectively regularizing land tenure and strengthening the existing affordable housing stock. This allows communities to remain on site, despite the government discourse focusing on the need to eliminate informal settlements by displacing people from their communities. As described above, the lack of land tenure documentation has been an impediment for many informal communities in Puerto Rico to access the help needed to get back on track after Hurricane María. Nevertheless, the residents of the Caño communities have found a foothold in their organization where they encounter guidance and a support system for their particular needs. No federal or local agency can legitimately say that the residents of the Caño communities lack land title. The collective ownership of the land has been proven to be a shield around the community residents, making them less

vulnerable to displacements despite repeated government threats. The implementation of the District Plan will make them less vulnerable to floods and help them prepare to face the effects of climate change.

Collectivization of land ownership as a strategy to reduce the vulnerabilization of residents in unplanned settlements and the democratization of ecological sustainability are based on these processes of critical and autonomous thinking. Many community participation experiences in urban development processes are weakened by the antagonistic contexts in which they are taking place, despite their genuine commitment to social transformation (Escobar, 2017: 66). If the creation of instruments like community land trusts are not supported by processes of critical and autonomous thinking led by residents, efforts will turn into instrumentalism (where the instrument becomes the goal) and developmentalism. As full citizen control is not aimed for, these efforts will then in se be no different from other top-down interventions.

4. Conclusion

In what is described above, we have presented the Caño CLT as a mechanism which enables residents to hold, steward and manage their land with the aim to guide their own comprehensive neighborhood development. We have argued that through their CLT, the G-8, and the ENLACE Project, the residents have achieved a 'more inclusive mode of environmental production' (Swyndedouw and Heynen, 2003: 914), or the democratization of planning for social and ecological sustainability. This counters the vulnerabilization of their communities by strengthening them through participatory on-site rehabilitation, restoring the environmental qualities of the tidal channel and reducing the risk of flooding, while at the same time coming up with a solution to prevent gentrification and displacements that such an improvement of living conditions would cause. Community organizing and building strategic partnerships continue to be crucial to face these and other new challenges, such as ensuring CDBG-DR funds are used in support of their District Plan, rather than to displace those in need.

We have argued that studying the resistance of the Caño communities can help formulate political-ecological urban strategies and advance the search for examples of true democratic participation that counter the 'politics of unsustainability', which produce profound socio-environmental inequalities in Puerto Rico. Vulnerability in informal settlements, indeed, should not be studied without also looking at urban inequality, which deserves more attention than has been given in this article.

As one of the biggest landowners in San Juan, collective land ownership has given residents of the Caño CLT the political power to confront the state and control the development of their area and the protection of the channel, within a context of profound neoliberal globalization and colonialism. They are producing an urban environment that is in line with their worldviews and departs from market-led development while favoring socio-ecological preservation. In today's context of climate change and growing inequality, this is exemplary.

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