ROMY KIESSLING –

Lake Palcacocha

The Peruvian Andes are home to 70 percent of the world's tropical glaciers, and, in the last four decades, they have gradually ebbed away. This process has consequences for major lowland cities that rely on mountain ecosystems for water, agriculture, and their livelihoods. But even more worrying, this melting generates swollen glacier lakes and destabilizes other glaciers located above, making major avalanches more likely. Lake Palcacocha, in the mountain range Cordillera Blanca, Peru, is one such expanding glacier lake: its volume increased from 0.5 million cubic meters in 1974 to 17 million cubic meters in 2009.[1] Below the lake lies the Andean city of Huaraz in the valley of Callejón de Huaylas with more than 120,000 inhabitants. In the event of an avalanche, the meltwater of the lake could flood and destroy large parts of the city as it flows downstream toward the Santa River at the bottom of the valley.[2] On several occasions since 2009, the Peruvian government and the National Authority for Civil Protection (INDECI) declared a state of emergency, which led to the installation of an emergency drainage system at the lake.

According to a 2015 study by the INDECI, the lake has presented a persistent risk over the years despite formal states of emergency. The regional government of Ancash is considering further actions: lowering the lake level by another 15 to 30 meters through a more efficient drainage system, reinforcing the existing artificial dam, creating a more technologically advanced early warning system with sensors and sirens, and equipping the city with evacuation

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[1] A bathymetric survey revealed this figure in 2009. It was updated with a lake bathymetry in 2016 by the National Water Authority (ANA) that showed a lake volume of 17.4 million m3. See César A. Portocarrero Rodríguez, "The Glacial Lake Handbook: Reducing Risk from Dangerous Glacial Lakes in Cordillera Blanca, Peru" (Washington, DC: USAID, 2014), 25–27; and Saúl Luciano Lliuya, "Kläger: Schriftsatz" Germanwatch, September 29, 2016, link.

[2] In 1941, an ice avalanche triggered a glacial lake outburst flood (GLOF) from Lake Palcacocha, below the Pucaranra and Palcaraju summits. The flood killed an estimated 5,000 people in Huaraz, which was a third of its population at the time. See Portocarrero, "The Glacial Lake Handbook," 25–27.

Lake Palcacocha below the glaciers of the Palcaraju and Pucaranra summits. Photograph by Óscar Vilca, INAIGEM.

Lake Palcacocha is drained using siphons to avoid Glacier Lake Outburst Floods [GLOF]. Photograph by Mattias Borg Rasmussen.

maps.[3] So far, however, none of this new flood mitigation infrastructure is in place.[4] The stalemate of mitigation measures is due to a lack and/or mismanagement of funds by the regional government in Ancash, an outcome of political and economic reasons, and it is influenced by various social groups and their conflicting interests.

A major factor leading to the current lack of infrastructure was the shift in responsibility (and thus funding) for disaster prevention from a Peruvian state-funded agency to regional governments around the 2000s. As a result, the state agency's more long-standing lake-lowering plans—intended to decrease the water level of Palcacocha by 15 meters—were abandoned in favor of a cheaper, temporary solution in 2010/2011.[5] Aside from flood prevention, water scarcity is also a growing concern due to unseasonally melting glaciers, which complicates the debates about mitigation infrastructure. Local farmers and regional municipalities have used glacial runoff for irrigation and drinking. In addition, since the 1940s, energy companies and water developers for hydroelectricity profit from the runoff. Therefore, future mitigation and protection measures must not only prevent floods but also retain and utilize the water the glaciers are increasingly shedding. As a result, the glacier lake has become not only a natural hazard but also a natural resource, scientific laboratory, and a disappearing spiritual and cultural place.[6] But for now, the interim plastic pipes siphoning off water and the vigilant guards permanently observing the lake are all that stands between the ominous lake and the residents below.

Over the years, increasingly aware of the risk to which they were exposed, Quechua-speaking farmer and mountain guide Saúl Luciano Lliuya and other residents of Nueva Florida in Huaraz began floodproofing their own homes.[7] Nueva Florida is one of the most vulnerable neighborhoods in Huaraz due to its exposure, high density, and poverty. The Peruvian Ministry of Health and INDECI recently determined that Lliuya's street is particularly at risk of flooding. The street lies at the intersection of two rivers, the Rio Paria and Rio Auqui, prone to overflowing. At the entrance to the city these two rivers merge to form the river Rio Quillcay, which then flows into Rio Santa. All the neighboring estates and homes, including Lliuya's, along the course of the

[3] After an earthquake in the 1970s that destroyed the former rammed-earth dam of the 1940s, a robust artificial dirt dam with steel drainpipes was installed. This is still in place today but is no longer sufficient. The lake volume would decrease to 10.8 million m3 if lowered by 15 m and even to 6.3 million m3 if lowered by 30 m. See Lliuya, "Schriftsatz," 32; and Marcelo Somos-Valenzuela et al., "Modeling a Glacial Lake Outburst Flood Process Chain: The Case of Lake Palcacocha and Huaraz, Peru," *Hydrology and Earth System Sciences*, vol. 20, no. 6 (July 2016): 2,519–2,543.

[4] See Brooke Jarvis, "Climate Change Could Destroy His Home in Peru. So He Sued an Energy Company in Germany," *New York Times*, April 4, 2019, link.

[5] The implementation of neoliberal reforms led to the privatization of Peru's hydroelectric industry during the 1990s. Subsequently, the US-based company Duke Energy managed the waterscapes and hydroelectric plants of Cordillera Blanca and became one of the largest private energy companies in Peru. The state-run Glaciology and Hydrology Resource Unit, which monitored and mitigated glacier hazards in the Cordillera Blanca also closed in 1996–97. Up to that point, disaster mitigation through glacier research and glacial lake engineering—which started after the catastrophe of 1941—had mostly been run by state-owned hydroelectric companies. A state-funded agency for assessing and preventing glacial hazards was resuscitated in 2001 but with less budget and few resources. See Portocarrero, "The Glacial Lake Handbook," 25–27; Mark Carey, *In the Shadow of Melting Glaciers: Climate Change and Andean Society* (New York: Oxford University Press, 2010); and Jane Palmer, "The Dangers of Glacial Lake Floods: Pioneering and Capitulation," *Eos*, March 1, 2019.

[6] Carey, *In the Shadow of Melting Glaciers.*

[7] Quechua is spoken by some indigenous peoples in Latin America. Lliuya's family has rural roots; they, like many Andean mountain communities, originally made their living from subsistence farming. However, they've lived in Huaraz since the 1980s. According to Noah Walker-Crawford, a social anthropologist at Manchester University and longtime collaborator of Lliuya, the Andean rural population has been, and is still discriminated against and has less access to education and the job market. Walker-Crawford had stressed the fact that Lliuya doesn't use the term "Indigenous" for himself. Peru, like the rest of Latin America, is a country whose history has been determined by the legacy of Spanish colonialism. Racist ideologies conditioned most domains of the country's political and economic structures, engendering a social order that was upheld by entangled forms of violence: the dispossession, exclusion, and subjugation of Native and African people and cultures, and the exhaustive exploitation of natural resources. In the sixteenth century, Huaraz and other Calljón de Huaylas towns were founded by Spaniards—though the area was already inhabited by the Waras, pre-Hispanic indigenous people. Nowadays extractive/neoliberal capitalism still generates complex manifestations of hegemony that extinguish indigenous and rural communities across the resource-rich territories of Latin America, a process that also affects the region of Cordillera Blanca. In the scope of this article, I can only briefly address questions of Indigenous rights, land claims, infrastructures, and epistemologies. For a more comprehensive account of the complex spaces that have been formed by the colonial encounter in Peru and Latin America, see Macarena Gómez-Barris, *The*

rivers would suffer severe damage in the case of flooding. While traditional building techniques in this part of Peru use adobe and timber structures, in order to make the house more stable, Lliuya replaced these materials with concrete and brick. He also added a second floor to create a safe refuge in the event of flooding.[8]

In 2015, with the support of the German NGO Germanwatch, Lliuya filed a lawsuit against RWE AG, Germany's largest energy provider and Europe's single largest emitter of CO2.[9] The claim at the center of the lawsuit states the company, which does not operate in Peru, has contributed about 0.47 percent of the emissions causing global climate change and that it should therefore be responsible for 0.47 percent of the cost spent by Lliuya and/or third parties on implementing safety measures to protect his house and property.[10] This 0.47 percent figure is based on a scientific attribution report published in 2014 by Richard Heede (of Climate Accountability Institute), which states that just ninety companies are responsible for two-thirds of all greenhouse gases (GHGs) emitted between 1854 and 2010.[11] To arrive at RWE AG's share in global historic emissions, and at the company's liability, Germanwatch applied the so-called *market share theory*.[12] Consequently, Lliuya is seeking €7,000 from RWE AG to help install the lake's safety measures, as well as an additional reimbursement of €6,400, which he already spent on flood protection measures.[13] According to Dr. Roda Verheyen, Lliuya's lawyer:

> THE SOLE OBJECTIVE OF THE CLAIM IS TO OBTAIN THE DEFENDANT'S PARTICIPATION IN ELIMINATING THE ACUTE DISTURBANCE TO THE PLAINTIFF'S PROPERTY (I.E., THE INCREASED RISK OF FLOODING) IN AN AMOUNT PROPORTIONAL TO ITS RESPONSIBILITY FOR THE PROPERTY DISTURBANCE, WHICH IS A CONSEQUENCE OF THE CONTRIBUTION OF THE DEFENDANT'S POWER PLANTS TO CLIMATE CHANGE.[14]

This present article argues that the two building typologies in Lliuys's legal case—the plaintiff's climate-affected house and RWE AG's power plants—

Interim pipes draining the water and exiting the tunnel under the artificial dam. Photograph by Óscar Vilca, INAIGEM.

Extractive Zone: Social Ecologies and Decolonial Perspectives (Durham, NC: Duke University Press, 2017); and Sylvia Wynter, "1492: A New World View," in *Race, Discourse, and the Origin of the Americas: A New World View*, eds. Sylvia Wynter, Vera Lawrence Hyatt, and Rex Nettleford (Washington, DC: Smithsonian Institution Press, 1995), 5–57. And for a more specific account of the interlinked environmental history in Cordillera Blanca, see Carey, *In the Shadow of Melting Glaciers: Climate Change and Andean Society*.

[8] Lliuya's father bought the property in Nueva Florida in 1984 as land was inexpensive along the riverbank. Although this specific neighborhood was flooded and totally destroyed after the flood of 1941, successful mitigation in the 1970s allowed residents to start building again. By the 1980s, government promises made development in Nueva Florida seem secure, especially as techno-scientific solutions appealed to the local community over hazard zone laws or relocation. See, in particular, Lliuya, "Schriftsatz," September 29, 2016, 50; as well as Lliuya, "Claim," Germanwatch, November 23, 2015, 9-10, link; and Esther Hegglin and Christian Huggel, "An Integrated Assessment of Vulnerability to Glacial Hazards: A Case Study in the Cordillera Blanca, Peru," in *Mountain Research and Development*, vol. 28, no. 3/4 (August 2008): 299–309.

[9] Lliuya did not file the lawsuit as part of a political organization or an indigenous group but is in contact with various groups. He receives support from Germanwatch, mainly regarding press and publicity matters and financial support from the German foundation "Stiftung Zukunftsfähigkeit."

[10] Higher Regional Court of Hamm, "Indicative Court Order and Order for the Hearing of Evidence," Germanwatch, March 30, 2017.

[11] Richard Heede, *Carbon Majors: Accounting for carbon and methane emissions 1854–2010* (Snowmass, US: Climate Accountability Institute, 2014). Richard Heede's study is an analysis of historical data on fossil fuels extracted by ninety entities, based on production data from 1854 to 2010. Shockingly, the share of RWE AG only relates to data on lignite, which means that the actual share would be even higher. Even more startling, the available data for RWE AG goes back to only 1965, and there is good reason to assume high emissions between 1930 and 1965 that could not be included in the report at all. Also see the updated report here: Dr Paul Griffin, *CDP Carbon Majors Report 2017* (London: CDP, 2013).

[12] The theory posits that the company's liability costs are equal to their fractional contribution to cumulative CO2 emissions globally multiplied by the added damages due to climate change. Crucially, this theory relies on several testable assumptions, one of which is the conclusion that attributable climate change impacts increase linearly with cumulative carbon emissions.

[13] According to a scientific report and calculations by the Peruvian state agency INRENA, the mitigation measures at the lake would cost the Huaraz community €8.5m; 0.47 percent of the sum would be €7,000. The payment would go to the Waraq association of municipalities (joint municipality and public corporation under Peruvian law), which would use it to implement measures appropriate to protect the plaintiff and the city of Huaraz.

[14] Saúl Luciano Lliuya, "Appeal," Germanwatch, September 5, 2017, 1, link.

The Nueva Florida neighborhood, center, between the two rivers Rio Paria und Rio Auqui. Photograph by Felipe Fittipaldi.

operate at several scales. First, they become a proxy for registering climate injustice (e.g., the house and the property rights that come with it stand in for the melting glacier) since the unequal distribution of harm is revealed through infrastructures—both those originating *from* and adapting *to* the structural violence of CO2 emissions. Secondly, the house and the plant become the grounded site by which to locate *field causality*, challenging the legal forum as well as traditional modes of representing climate change. Finally, they bring into sharp contrast the scalar dilemma of translation between global scientific knowledge and the situated *house at risk*.

Energy Architecture

The effects of climate change are sociopolitically and geographically uneven and are inextricably linked to broader historical, economic, or intersectional processes.[15] As a consequence, economically and ecologically vulnerable states, least responsible for CO2 emissions, are the hardest hit and therefore pay the most for *climate-resilient* measures, like adaptation and mitigation.[16] Meanwhile, the states that have contributed most to climate change are usually capable of protecting themselves from its effects.[17]

Germany is going through a so-called *Energiewende* ("energy turn"), which means the complete abandonment of nuclear and fossil fuels in favor of renewable energies. Policies include carbon taxes, effectual international treaties, increased subsidies for business and research in renewable energy, decreased subsidies for fossil fuels and nuclear energy, reforestation, land-use reform, and investments in energy efficiency, energy storage, and carbon-capture technology. As part of the process, the last coal power plant in the country will be closed by the end of 2038.[18] This is quite late considering there has been scientific consensus about the effects of GHGs in Germany since the beginning of the 1990s. Additionally, as early as 1995, RWE AG demonstrated an awareness of its role in climate change when it declared to "reduce CO2 emissions by 2015 by 12.5 percent compared with 1990."[19] It

[15] For a comprehensive analysis of climate justice discourse, see Anil Agarwal and Sunita Narain, *Global Warming in an Unequal World: A Case of Environmental Colonialism*, (New Delhi: Center for Science and Environment, 1991); and Malini Ranganathan and Eve Bratman, "From Urban Resilience to Abolitionist Climate Justice in Washington, DC," *Antipode*, June 28, 2019.

[16] See the following reports: David Eckstein, Marie-Lena Hutfils, Maik Winges, and Germanwatch, "Global Climate Risk Index 2019 Who Suffers Most from Extreme Weather Events? Weather-Related Loss Events in 2017 and 1998 to 2017," Germanwatch, 2018; and UNFCCC, "Low-Income Countries Hit Hardest by Soaring Costs of Climate-Related Disasters," United Nations Climate Change, October 11, 2018, link.

[17] The historical culpability for global warming sits primarily with highly industrialized countries, like Western Europe, United States, and Russia (if we look at emissions since the Industrial Revolution), and India and China due to massive carbon-based expansions over the last twenty-five years. The countries most affected by adverse climate impacts—resulting from extreme weather events or slow onset events like sea-level rise, glacial retreat, loss of biodiversity, and desertification—are predominantly less industrialized and located in the "global South." This situation is further complicated by global capitalism, where, for instance, vulnerable countries are pushed to increase levels of economic production, while Western ethical and environmental policies and regulations are changing in regards to GHG emissions. Under Article 4.3 of the UN Framework Convention on Climate Change (UNFCCC), "developed" countries commit to providing funding for the "agreed full incremental costs" of climate change for vulnerable states. However, the funds provided to date are inadequate and shift the responsibility to act (to adapt) to the most vulnerable states. See Liane Schalatek et al., "The Global Climate Finance Architecture (2018)," Climate Funds Update, link, and UNFCCC, "Introduction to Climate Finance," United Nations Climate Change, link; and see Global Carbon Atlas, "CO2 Emissions," link.

[18] Federal Ministry for Economic Affairs and Energy, "Kohleausstieg und Strukturwandel," link.

[19] Lliuya, "Claim," Germanwatch, November 23, 2015, 17–18.

is also worth mentioning that German media had already published reports on anthropogenic climate change in the early 1980s.[20]

RWE AG was founded in 1898 as the *Rheinisch-Westfälisches Elektrizitätswerk AG* and is a publicly listed electricity and gas supplier based in Essen. Hard coal and lignite are fuels with the largest market share of power generation in Germany. RWE AG operates coal-fired and lignite-based power plants in several German cities. In comparison with other fossil fuels, burning lignite creates, by far, the most CO2 emissions. The world has around 3,000 coal-fired power plants, hundreds of which were built after the Paris Agreement in 2015. Germany has about 300 power plants, 70 of which are still open and coal-fired. RWE AG's coal-fired plants in Neurath and Niederaussen have the highest CO2 emissions in Germany and the second and third highest in Europe.[21]

Power plants are built from blueprints developed by economists, demographers, policy analysts, engineers, and sometimes architects. Those plans may include certain modes of understanding risk, growth, and the common good. Although German and European regulations control power plant operations, economic growth remains a priority, which means that jurisdictions will continue to allow power plants even if they pose a high risk for society. As a result, power plants must be seen as deeply rooted in the capitalist logic of the highly industrialized West. Further, these energy buildings render visible the complicated questions of complicity and liability in the *state-corporate nexus* of liberal democratic states.

RWE AG is well aware of state policies to decrease coal use and has therefore taken precautions for the future. The company is already negotiating compensations with the German government: €1.5 million per switched-off gigawatt. Additionally, RWE AG has agreed on a multibillion-dollar shift to renewable energies. It will take over the "green power plants" of its subsidiary Innogy and its competitor Eon in exchange for their networks and distribution business. Furthermore, over the last few years, RWE AG has been buying cheap CO2 permits for their power plants and will therefore not suffer additional climate costs until 2050.[22]

What is revealed by analyzing the broader sociopolitical effects of RWE AG's power plant strategy is its lack of accountability for the past by emphasizing its responsibility for the future. Current Western governments and fossil fuel companies provincialize environmental concerns by implementing an inherently conservative principle of sustainability. And when focusing on environmental efficiency, they apply techno-scientific, market-led approaches. But these practices run the risk of inadequacy and codifying existing privileges, conflicts, and injustices.

Property as a Standpoint of Critique

Lliuya filed a lawsuit against RWE AG based on German civil law, specifically §1004. Section 1004 of the German Civil Code (BGB) states:

> (1) IF THE OWNERSHIP IS INTERFERED WITH BY MEANS OTHER THAN REMOVAL OR RETENTION OF POSSESSION, THE OWNER

[20] For instance, "Die Klima Katastrophe," *Der Spiegel* no. 33 (1986), link.

[21] Europe Beyond Coal, "European Coal Plant Database."

[22] See Daniel Wetzel, "Ausgerechnet RWE Profitiert von Deutscher Klimapolitik," *Die Welt*, August 15, 2019; Bill McKibben, "A Future without Fossil Fuels?" the *New York Review of Books*, April 4, 2019, link; and Paul Hockenos, "Carbon Crossroads: Can Germany Revive Its Stalled Energy Transition?" *Yale E360*, December 3, 2018, link.

> MAY REQUIRE THE DISTURBER TO REMOVE THE INTERFERENCE. IF FURTHER INTERFERENCES ARE TO BE FEARED, THE OWNER MAY SEEK A PROHIBITORY INJUNCTION.
>
> (2) THE CLAIM IS EXCLUDED IF THE OWNER IS OBLIGED TO TOLERATE THE INTERFERENCE.[23]

The provision under which Lliuya sued is based on property law. Yet, it is similar to private nuisance under the common law legal system, an area of tort law.[24] The choice between the two different claims —for injunctive relief or removal—depends on whether the impairment of property has already occurred or not. In order for his case to fall within the scope of ₡004, Lliuya has to prove that his house/property is at risk within the definition of *seriously threatening impairment* (in German: "ernsthaft drohende Beeinträchtigung"). *Seriously threatening impairment* means that the plaintiff's house faces the imminent threat of flood or mudslide. The risk to the house—when it refers to a property impairment—is to be assessed according to two parameters: the probability and magnitude of the possible damage.[25] Interestingly, the provision also protects the plaintiff's property when it is located in a foreign territory. Based on the EU Rome II Regulation (private international law), Lliuya could either invoke a law in the location of damage or loss—Peru—or the law in the place of issue—Germany.[26]

In climate change and human rights litigation, the prosecution does not tend to resort to property law.[27] Property regimes are fundamental for contemporary forms of capitalism like neoliberal development (but most tangible through financialized real estate markets), which deploy strategies of accumulation and valorization at the expense and expropriation of labor, land, and resources.[28] Moreover, property regimes have also been the central force of colonial capitalism, and some contemporary property law may still be shaped by the colonial encounter.[29]

Legal scholar Brenna Bhandar notes, "If the possession of the land was (and remains) the ultimate objective of colonial power, then property law is the primary means of realizing this desire … modern property laws emerged along with and through colonial modes of appropriation."[30] In her book *Colonial Lives of Property*, Bhandar traces and analyzes the racial regimes of ownership in specific liberal democratic settler states. In doing so, she argues that colonialism developed on the basis of a *juridical formation* constituted by private property ownership and the racialized subject. Furthermore, she draws on the concept of *racial capitalism* developed by Cedric J. Robinson. For Robinson the transatlantic slave trade and appropriation of Native lands and resources do not mark the beginning of racial property regimes: racism had already infused European feudal society and was only subsequently globalized through the emergence of colonial capitalism.[31] Through capitalism, European civilization tended not to homogenize but rather to create an *economy of difference*: centralized in the figure of the possessive (European) individual and the "other," ontologically and legally dispossessed of and excluded from the ability to own.

As a consequence, Bhandar suggests, "the production of race and racial subjects is intrinsic to capitalism."[32] And further, she states,

[23] Lliuya, "Claim," 2.

[24] Tort, in common law jurisdictions, refers to the harm or infringement of a legal right that requires redress. Generally, many claims that arise in civil court, with the exception of contractual disputes, fall under tort law. Plaintiffs in tort cases must show that they have sufficient connection to a specific harm (so-called standing) and that they bear an actual injury or damage, including a future one, caused by the wrongdoing of the defendant. The original intent of tort is to provide relief, usually by awarding monetary damages as compensation for proven harms. Under German law, most torts fall under the category of "Deliktsrecht" stemming from the Roman-law tradition.

[25] The risk or prospective impairment to his property needs to be provable by scientific evidence that answers the following questions: Is there an imminent threat of avalanche that would affect the lake? What would be the consequences of an avalanche for the lake and the property of the plaintiff? At what magnitude (mass and volume) would this result in a flood wave, which would either flow over the natural moraine dam and the two artificial dams and/or destroy them? And under which conditions would the property of the plaintiff be flooded (height and speed)? Any assertion in response to these questions is only verifiable by way of models and statistics, and the results of these simulations and calculation would mostly be converted into preliminary hazard maps. For example, on a Peruvian authorities' hazard map that was handed in as evidence the house of the plaintiff is situated in the most hazardous zone where inundation would persist after an initial flood has drained. Of course, the adverse effects on the material condition of his property can take different forms in various avalanche scenarios: the damage could range from, at least, severe erosion to absolute destruction. Through several scientific studies, governmental reports and expert statements, the plaintiff has already presented evidence for the *seriously threatening impairment* of his house. Nevertheless, the appeals court has appointed experts to respond to the request for evidence, which includes, as a first step, a visit to the *house at risk*. See Higher Regional Court of Hamm, "Indicative Court Order and Order for the Hearing of Evidence," 3–4; and "Beschluss zu teilweiser Abänderung des Beweisbeschlusses," Germanwatch, August, 23, 2018, 1–2.

[26] Lliuya, "Claim," 2.

[27] For example, until 2018, RWE AG could expropriate villages in Germany for the expansion of their coal mines according to the German property law code ₡4.

[28] For instance, the ongoing significance of primitive accumulation in present forms of capitalism has been demonstrated in Silvia Federici's work, as well as in David Harvey's concept "accumulation by dispossession." See David Harvey, *The New Imperialism* (Oxford: Oxford University Press, 2015); and Silvia Federici, "On Primitive Accumulation, Globalization, and Reproduction," *Friktion*, September 9, 2017.

[29] Take, for instance, the Spanish colonial appropriation of indigenous lands (upon which slavery in the Americas was contingent) during sixteenth century in the area of Peru. More specifically, the process of privatization inaugurated a land tenure system that permitted only land rights and legal titles to those with Spanish inheritance, enacted through the hacienda system, which legally rendered the Indigenous people and their Andean systems of communal and customary law nonexistent. See: Joanna Drzewieniecki, "Indigenous People, Law and Politics in Peru," paper given at the Latin American Studies Conference, Washington, DC, 1996. More

"the architecture of modern, liberal, democratic state forms have been revealed as intricately bound to a globalized if differentiated system of racial capitalism."[33] In other words, to paraphrase Silvia Federici: the history of primitive accumulation, past and present, cannot be fully understood if only analyzed from the position of the waged workers. It must comprise the enslaved, the colonized, and the indigenous people whose lands continue to be the main target of capitalist enclosures.

Economically and ecologically vulnerable communities like Andean farming and indigenous mountain economies are at the forefront of anthropogenic climate change and have been experiencing the dynamics of adverse climate impacts for years. As mentioned above, RWE AG and the Western fossil fuel industry were informed by the 1990s, if not earlier, about the consequences of CO2 emissions, and they have yet to put sufficient measures in place to reduce emissions. Meanwhile, their complex strategies/practices of extraction, investment, and negligence produces subjects who are confronted with the risk and uncertainty of economic volatility due to anthropogenic climate change—predominantly in the "global South." Therefore, the co-emergence of racialized subjectivities (interlocked with gender and class) and property relations might be also traced in the Western fossil fuel industry—mapping "new territories" of accumulation and dispossession onto previous colonial regimes of race and property.[34]

Thus, to utilize property rights and the concomitant architectures of this specific case runs the risk of reifying and re-inscribing asymmetric politics and histories of Western property regimes. Yet, I argue, it could potentially become a moment of *legal-architectural rupture*. As discussed by Bhandar:

> … THIS IS WHAT DEFINES A LEGAL STRATEGY OF RUPTURE: A FORM OF IMMANENT CRITIQUE THAT EXPOSES THE CONTRADICTION INHERENT IN RIGHTS THAT ARE DEFINED BY AN ILLUSORY SEPARATION OF THE PUBLIC SPHERE FROM THE PRIVATE; AND BY DOING SO, ILLUMINATES HOW RIGHTS THAT APPEAR AS "REAL" RIGHTS ARE IN FACT, IN THEIR CONTENT, ENFORCEMENT AND REALIZATION TOO OFTEN SHAPED BY THE "PARTICULAR ELEMENTS" OF THE SO-CALLED PRIVATE SPHERE, NAMELY, THE IMPERATIVES OF CAPITALIST DEVELOPMENT, EMBEDDED IN COLONIAL MODES OF GOVERNANCE.[35]

The plaintiff's house disrupts and challenges the status quo of Western property law by insisting on equal application of the aforementioned legal provisions: the security of private property. Yet instead of utilizing property rights as a means for re-inscribing neoliberal development imperatives, the *house at risk* becomes a tool for the establishment of transnational climate justice. Furthermore, this case exposes the limits and contradictions of the Western legal forum and its legal terms and could therefore provoke legal-political ruptures.

Causality

As Lliuya's case currently enters the first evidentiary phase, he must

concretely, in regard to the current case, it seems possible, according to Brenna Bhandar, that German land and property law was affected by German colonialism in Namibia

[30] Brenna Bhandar, *Colonial Lives of Property: Law, Land, and Racial Regimes of Ownership* (Durham, NC: Duke University Press, 2018).

[31] Robin D. G. Kelley, "What Did Cedric Robinson Mean by Racial Capitalism?" *Boston Review*, January 12, 2017, link. €

[32] Brenna Bhandar in conversation with Daniel Loick, "The Colonial Lives of Property: Abolitionist Struggles and Alternative Imaginaries," *Texte zur Kunst* 117 (March 2020).

[33] Brenna Bhandar and Davina Bhandar, "Cultures of Dispossession: Rights, Status and Identities," *Darkmatter Journal*, link.

[34] Denise Ferreira da Silva and Paula Chakravartty, "Accumulation, Dispossession, and Debt: The Racial Logic of Global Capitalism—An Introduction," *American Quarterly*, vol. 64, no. 3 (2012): 361–385.

[35] Brenna Bhandar, "Strategies of Legal Rupture: The Politics of Judgment," *Windsor Yearbook of Access to Justice* vol. 30, no. 2 (October 2012): 59.

prove that the possible flood resulting from water in Lake Palcacocha poses a *seriously threatening impairment* to his property. In the second phase of the trial, he will have to provide evidence for the causal chain that links CO2 emissions released from the defendant's power plants to higher concentrations of GHGs throughout the Earth's atmosphere, and that results in a reduction in the global emission of thermal radiation and an increase in global temperature. The increase in average local temperatures accelerates the melting of the glaciers, and as the glacier recedes, the volume of water in Lake Palcacocha increases. Furthermore, Lliuya has to prove that the defendant's share in the contributory causation, in the causal chain outlined above, is measurable—and that it accounts for 0.47 percent of the total.[36]

Similar to in tort law, it is obligatory to establish causality between cause and effect. And to prove causality through climate science poses a serious challenge to empirical thought and Western philosophy. Events that are imperceptible without sophisticated technical mediation, like the climate model, escape its grasp.[37] However, explaining and determining facts is normally nonlinear and relies on a set of assumptions. Natural science cannot determine cause-effect relationships with absolute certainty: it works instead by ruling out certain relationships. This is especially the case for the climate, which is highly nonlinear.[38]

So far, case law in Germany does not provide any conclusive statements about the theoretical underpinnings of its causality theory. Hence, in order to specify the undefined legal notion of causality, German law deploys a twofold test: marked first, by the equivalence theory, in the sense of the *condicio-sine-qua-non* formula, and second by the *adequacy theory*.[39] Following the *conditio-sine-qua-non* formula, something is causational only if when the thing in question ceases, the impairment also ceases. The present case falls indisputably into the category of cumulative damages or cumulative causation. In these cases, the *conditio-sine-qua-non* formula can only be applied when something contributes to the causation and when the sum of all contributions indirectly leads to the impairment of property. According to the adequacy theory, the defendant is not responsible for such events, which, according to the common perspective of an objective third party, lie completely outside experience and expectation. In terms of predictability, the current case is attributable as delineated above since RWE AG was informed about the consequences of their emissions as early as 1990.[40]

Furthermore, German case law does not request linearity as a prerequisite for proving a causal chain. Still, RWE AG argues that a "linear chain of causation" is a prerequisite for any liability under the terms of ₹1004 (and under liability law in general). And as the corporation stresses, there is no linear chain of causation between the glacial lake and the emissions of the power plants.[41] Indeed, the crucial challenge within the aforementioned causal chain is the *causal field* between anthropogenic global warming and the melting of the Palacraju and Pucaranra tropical glaciers in the Peruvian Andes.[42][43]

RWE AG is contesting precisely this part of the causal chain. By doing so, the corporation emphasizes the role of climate variability and extreme weather events for the local climate. The corporation refers here, for instance, to the extremely short term and local influence of the Pacific Decadal

[36] Higher Regional Court of Hamm, "Indicative Court Order and Order for the Hearing of Evidence."

[37] Adrian Lahoud, "Floating Bodies," in *FORENSIS: The Architecture of Public Truth*, ed. Forensic Architecture (Berlin: Sternberg Press, 2014), 495–518. €

[38] Roda Verheyen, "Loss and Damage Due to Climate Change: Attribution and Causation—Where Climate Science and Law Meet," *International Journal of Global Warming*, vol. 8, no. 2 (2015): 158.

[39] Lliuya, "Claim."

[40] Indeed, RWE AG and its predecessors produced a lot of emissions before that time, but this case doesn't reach far beyond 1990. Nevertheless, the question remains important for climate justice discourse: since when did fossil fuel companies like RWE AG know about the consequences of their emissions and yet lobby against climate policy? See for example current legal case: "Historic Climate Lawsuit against Shell Filed in the Netherlands," *Center for International Environmental Law*, September 5, 2019.

[41] RWE AG, "Response to the Appeal," Germanwatch, July 10, 2017, 5–7, link.

[42] Cases like this could challenge alternative ethical-legal parameters for causation. Since field causality rather than linear causality is perhaps a more reasonable frame for addressing "forms of violence that are not ruptural, but rather slow and continuous, without clear beginnings or ends." See Eyal Weizmann, "Introduction: Forensis," in *FORENSIS: The Architecture of Public Truth*, ed. Forensic Architecture (Berlin: Sternberg Press, 2014), 9–32.

[43] Any assertion about the nonlinear climate system is only verifiable by way of models and statistics. But global climate models, as opposed to glacier models, work with scales and resolution, where glaciers are hardly visible. But according to the expert witness and glaciologist Dr. Christian Huggel, it is possible to create a combined simulation of a glacier and climate model in order to calculate the causal contribution of the issuer to the melting of the glacier—of course, with uncertainties. See Lliuya, "Claim."

Oscillation (PDO) and El Ni6 Southern Oscillation (ENSO), the importance of volcanic eruptions and the influence of soot deposits, and even to the controversial *hiatus* effect.[44][45] Among climate scientists, it is common knowledge that (on an annual or multiyear timescale) the global warming trend is strongly influenced by natural climate variability. However, on a multi-decadal timescale, the role of variability is evened out and the anthropogenic warming trend becomes clear.[46]

As stated by the plaintiff, it would not be necessary to prove (and maybe calculate) this part of the causal chain because the Intergovernmental Panel on Climate Change (IPCC) already concluded, with the highest degree of confidence, that there is a clear and dominant anthropogenic influence on the (observed and undisputed) melting of the Andean glaciers.[47]

[44] Both climate events are atmosphere-ocean phenomena in which precipitation and temperature can fluctuate dramatically in the Pacific region.

[45] The "hiatus effect" argument used by RWE AG is commonly used by climate change deniers—it posits that it became colder, not warmer, between 2002 and 2012 in the Cordillera Blanca and that there was a pause in the increase of globally-averaged surface temperatures between 1998 and 2013, which, of course, contradicts larger global warming narratives.

[46] Lliuya, "Appeal."

[47] The IPCC, an international expert body on climate science, was founded in 1988 and has since published five Assessment Reports on the extent and consequences of climate change in the future, the most recent being from 2013/2014. For example, see the following report: IPCC et al. ed., *Climate Change 2014: Impacts, Adaptation, and Vulnerability: Working Group II Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (New York, NY: Cambridge University Press, 2014).

Prospect

> WHAT WE ARE SAYING IS THIS IS HAPPENING AND IT'S PUTTING US AT RISK.
> THE DAMAGE CAUSED IS IRREVERSIBLE; FOR THAT NO AMOUNT OF MONEY IS ENOUGH.
> —SAÚL LUCIANO LLIUYA, PLAINTIFF[48]

The Higher Regional Court of Hamm (appeals court) stated in its most recent order, "Indicative Court Order and Order for the Hearing of Evidence" in 2017, that it accepted the claim of the plaintiff and dismissed the defendant's concerns regarding its admissibility and conclusiveness. The decision of the appeals court sets a legal precedent as it finds fossil fuel corporations can be held liable for climate-change-related impacts.[49] Subsequently, climate change litigation could be one tool to establish legal accountability in governance and the fossil fuel industry.[50]

Lliuya's lawyer, Dr. Roda Verheyen, stated in an interview with me that if the case fails, it will most likely be due to legal and not scientific disputes since the legal order depends on bureaucratic and narrowly defined legal-political categories. Thus, this case challenges the limits of recognition within the Western legal framework, whether these are the legal categories of German civil law cases, e.g. *causality*, or the rights of the glaciers themselves.[51] Moreover, it suggests that the legal forum might be insufficient in establishing climate justice and accountability, indicating that economic and political domains need to be reimagined across different scales of the natural and built environment as they have failed to regulate and significantly decrease CO2 emissions.

While corporations and governments alike remain unaccountable for pollution, natural resource extraction, and displacing entire communities, the issues around the causes and effects of climate change continue to be framed by cost-benefit analysis. Legal cases like this one might push forward accountability and visibility by adopting controversial or uncommon modes of resistance. By doing so, these strategies can subvert corporate-carbon state interests by shifting attention to the site of cause instead of rushing to repair the place of effect.

[48] Dan Collyns, "Climate Change Has Turned Peru's Glacial Lake Into a Deadly Flood Timebomb," *Guardian*, June 29, 2018, link.

[49] The court of first instance, the district court in Essen rejected the claim for protection measures due to legal grounds in December 2016. In short, the district court said that it is impossible to link emitters of CO2 to particular impacts in the context of legal causation. Lliuya appealed this judgment at the appeals court. On November 30, 2017, the appeals court essentially rejected the judgment of the court of first instance and followed the plaintiff in legal reasoning. This means that generally, liability of a large emitter for damage or risks in distant countries exists but only when scientific experts can prove partial (linear) causation. This must now be determined for Lliuya's house by scientific experts to the satisfaction of the appeals court. See "Interesting Facts: Background Information," Germanwatch, link. €

[50] Indeed, these types of litigations are already being increasingly studied and used by legal scholars and practitioners. Crucially for the unfolding of climate change litigations was the formal recognition of *loss and damage (L&D)* from anthropogenic climate change during the Paris Agreement as a third pillar of climate change action (alongside adaptation and mitigation). This means that member states accept that there will be a level of loss "beyond adaptation." However, political obstacles have resulted in intergovernmental compensation measures and liability being explicitly excluded as a means of addressing L&D. See Luke J. Harrington and Friederike E. L. Otto, "Attributable Damage Liability in a Non-Linear Climate," *Climatic Change*, vol. 153, no. 1–2 (March 2019): 15–20. €

[51] Conversations regarding *rights of nature* and care to nonhuman entities have been considered since the landmark essay "Should Trees Have Standing?" by legal scholar Christopher Stone, written in 1972.