

More-than-Human Figurations in Occupied Forests: Towards Ecological Solidarity within Environmental Conflicts

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Abstract: This contribution offers a theoretical, empirical, and conceptual approach to more-than-human figurations in occupied forests. It combines insights from posthumanist thought, relational ontologies, and science and technology studies and puts them in dialogue with debates about extractivism and socio-ecological transformations. Through insights from social movement and protest studies and based on empirical and participatory research, three more-than-human figurations within environmental conflicts, specifically in forest occupations, are carved out: 1) extractivist figurations between sand, forests, and economic actors within a globalised sand and gravel economy and its local impacts; 2) figurations of solidarity between humans and more-than-humans within and across forest occupations in Germany and 3) repressive more-than-human figurations, which articulate the ecologically destructive effects of sand extractivism, repression against climate (justice) activists and forest squatters. These three figurations are conceived as entangled elements of a string figure, which compose a counter-community of an ecological class aiming at the prefiguration of possible futures.

Zusammenfassung: Der Beitrag entwickelt einen theoretischen, empirischen und konzeptionellen Zugang zu mehr-als-menschlichen Figurationen in besetzten Wäldern. Er verbindet posthumanistische Perspektiven, relationale Ontologien und Ansätze aus den Science and Technology Studies (STS) mit Debatten zu Extraktivismus und sozio-ökologischer Transformation. Ausgehend von Forschungen zu Protesten und sozialen Bewegungen werden auf Basis empirischer und partizipativer Studien drei Figurationen in ökologischen Konflikten (v. a. Waldbesetzungen) herausgearbeitet: (1) extraktivistische Figurationen von Sand, Wald und ökonomischen Akteur*innen in der globalen Sand- und Kiesökonomie und ihren lokalen Folgen; (2) Figurationen der Solidarität zwischen menschlichen und mehr-als-menschlichen Wesen innerhalb und zwischen Waldbesetzungen in Deutschland; (3) repressive Figurationen, die zerstörerische Effekte der Sandextraktion und Repressionen gegen Klima(gerechtigkeits-)aktivist*innen und Waldbesetzer*innen zusammenführen. Konzipiert als miteinander verwobene Fadenspiele verweisen diese Figurationen auf die Gegengemeinschaft einer ökologischen Klasse, die auf die Präfiguration möglicher Zukünfte abzielt.

Keywords: forest occupations; extractivism; ecological solidarity; figurations; string figures; sand

Introduction

There was commotion in the *barrio*¹ when the noise of construction workers woke the squatters of a forest occupation south of Frankfurt on a cold winter morning in early 2025. Without any prior warning or notice, a subcontractor hired by the local sand and gravel company began building a so-called ‘toad fence’ around construction site ‘3a’, a small section of the approximately 63 hectares of healthy forest set to be cut down to further expand the open-cast sand and gravel mine near the city of Langen. Building such a toad fence is one of the few ecological requirements imposed on the local sand and gravel company, Sehring, so that they can continue extracting the mineral-rich quartz sand, a valuable ingredient in producing high-quality concrete as a construction material, from beneath the forest. Surrounding the area of the forest that will be cut down in the following clearing season, the fence is built in a way that allows the toads to escape the encircled area but not to re-enter it. Experienced squatters and supporters who were not present that day heard about the fence on the social media channels of the occupation. They understood that its construction signalled the imminent clearing of the forest and, in consequence, eventually a violent eviction of the protest camp.² The toads play a crucial part here, since they are one of the first inhabitants of the forest to end their hibernation period and to announce the impending end of winter. This fact has also been the point of departure in George Orwell’s essay *On the Common Toad* from 1946, wherein he defends the joy of being in/with nature as an ordinary pleasure despite living in times of crisis (Solnit 2022). To Orwell, the rarely appreciated toad that inaugurates spring is the symbol for taking

‘pleasure in the actual process of life’ (Orwell 2010: 5), a political act in itself. Returning to our forest occupation, it is fair to say that the toad announces the pending clearing of the forest and warns the squatters and supporters about the imminent danger to the forest and its human and more-than-human³ inhabitants, urging them to build more treehouses or barricades, discuss strategies for an eventual eviction, or prepare food supplies. The toad, therefore, does not remain a symbol for the appreciation of nature in the Orwellian sense but becomes part of a complex more-than-human figuration⁴ within an environmental conflict that includes the extractive sand and gravel industry, the forest, its inhabitants, and practices of ecological resistance and solidarity.

In accordance with its ‘foretelling capacity’, we follow the toad as a point of departure to introduce our contribution on more-than-human figurations in occupied forests, in which we seek to understand environmental conflicts and forest occupations in Germany as part of a complex network between minerals, trees, toads, and humans within ‘more-than-human worlds’ (Puig de la Bellacasa 2017). In the following, we investigate how the case of Langen illuminates the dynamics of complex more-than-human networks, and how a focus on such entanglements – conceptualised as more-than-human figurations – advances our understanding of extractivist economies and the resistances, such as forest occupations, that challenge them. Furthermore, we engage with that precise case study in order to enrich ongoing debates on extractivism and socio-ecological transformation conflicts by drawing attention to a hitherto overlooked phenomenon: sand and gravel extraction in Germany.

1 The Spanish word *barrio* (neighbourhood) has become the common term for the human settlements within forest occupations in Germany. Inhabitants oftentimes refer to themselves as ‘forest people’.

2 When submitting the manuscript for this article in late November 2025, the mentioned occupation near Langen as well as the occupation of the Sündenwald in North Rhine-Westphalia have been completely evicted.

3 We prefer the notion of *more-than-human* over the term *nonhuman*, because the latter ‘recentres the human at the moment you’re trying not to’ (Liboiron 2021: 43), while the former – still not overcoming this dilemma, though – rather allows to speak ‘in one breath of nonhumans and other than humans such as things, objects, other animals, living beings, organisms, physical forces, spiritual entities, and humans’ (Puig de la Bellacasa 2017: 1).

4 In accordance with the general aim of this Special Issue, we borrow the term *figuration* from Norbert Elias’ processual sociology (Elias 2012) and adapt it within a posthumanist and relational-ontological framework.

We first offer a theoretical and conceptual approximation of more-than-human figurations in occupied forests, in which we combine insights from posthumanist thought, relational ontologies, as well as Science and Technology Studies, and bring them in dialogue with (neo)materialist and Marxist perspectives on the climate crisis, especially debates about extractivism and socio-ecological transformations. The aim of this contribution is to put such insights at the centre of our understanding of forest occupations through a posthumanist and relational-ontological perspective on socio-ecological transformation conflicts that complements ongoing debates in (neo)materialist and Marxist political ecology.

Through insights from Social Movement and Protest Studies, we will then be able to articulate the more-than-human figurations within environmental conflicts, in which forest occupations in Germany play a crucial role. On that basis, we develop the argument that forest occupations are much more than traditional arenas of political negotiation and contestation. Rather, forest occupations intervene in the ‘disruption of relations with nonhuman beings induced by environmental destruction and displacement’ (Flemmer et al. 2024: 615), suggesting a different way of being and protesting with the forest and its inhabitants, eventually transforming human–forest relationships against the backdrop of ecological destruction.

In a second step, based on our empirical and participatory research within forest occupations in Germany, we will identify three types of more-than-human figurations that we observe in our context: 1) extractivist figurations between sand, forests, and economic actors within a globalised sand and gravel economy and its local impact; 2) figurations of solidarity between humans and more-than-humans within and across forest occupations in Germany, and 3) repressive more-than-human figurations, which articulate the ecologically destructive effects of sand extractivism and repression against climate (justice) activists and forest squatters. As we will show in the conclusion, these three figurations are not conceived as separate entities but are entangled through multi-

ple strings of narration that allow for the prefiguration of possible futures to surface.

1. More-than-Human Figurations in Environmental Conflicts

In order to contribute to the understanding of humans in their relations to more-than-human beings, we engage with contemporary theoretical debates within posthumanist thought and relational ontologies (Latour 2020, 2017, Haraway 2016, Tsing 2015, Blaser/Cadena 2018, Kohn 2013). These provide the conceptual framework through which we examine a concrete case study of a social and political conflict surrounding the protection, preservation, and destruction of the more-than-human environment. A social science research agenda inspired by these debates serves as a counterpoint to the pious mystifications of naturalism in the Anthropocene (Descola 2024) and demands to turn our theoretical and epistemological attention towards the *terrestrial* and its human and more-than-human inhabitants (Latour 2020). Such an interconnected and relational approach, which includes animals, plants, minerals, and humans alike, unlocks the possibility of ‘seeing the world not in one-selfness’ (Haraway 2016: 36), but in connection with others, like companion species. This brings human activity into connection with the ecological system to which humans belong (Morton 2019).

We seek to mobilise a posthumanist and relational-ontological approach for a sociological and social scientific analysis of human–more-than-human relations within the ongoing climate crisis – a historical constellation that has yet to become a central topic within sociological canon (Diekmann 2024). Such a perspective is able to ‘unmask the farce of the supposed universality of humankind, as it has been staged since the beginning of modernity’ (Pötzsch 2025: 352, translated by S.G./A.S.).

To make posthumanism and relational ontology ‘work sociologically’, we rely on the notion of figuration as developed by Norbert Elias (2012). To him, the concept of figuration evades the sociological bina-

rism between one part (the individuum) and a totality (society), centring instead on the interdependency, interconnectedness, and mutually constitutive (but, at the same time, conflictive) relationships between social actors and actions. A posthumanist adaptation of the concept of figuration therefore includes more-than-human activity and entities, such as trees, fungi, or rocks, in the calculation and focuses on how this ‘more-than-human sociality’ (Tsing 2015: 152) ‘intermeshes to form interwoven structures’ (Elias 2012: 128). This theoretical fusion between Elias and posthumanist approaches allows us to introduce the umbrella concept of more-than-human figuration for our following discussion. A more-than-human figuration describes an interwoven, open, and processual web in which interdependent, interconnected, mutually constitutive, and conflictive elements, such as actors and actants,⁵ practices, and life forms, coexist. In our case, a more-than-human figuration consists of an extractive sand and gravel industry, security companies and the police, the protective forest near Langen, and the human and more-than-human inhabitants of the forest, as well as their mutually conflicting or supportive practices of (1) destruction and extraction, (2) solidarity and resistance, as well as (3) repression.

Andreas Diekmann (2024: 3, translated by S.G/A.S.) recently argued that for the case of Germany, ‘[c]limate change, the most pressing issue of this century, is scarcely reflected in sociology’. This diagnosis⁶ stands in sharp contrast with a lively inter- and

transdisciplinary debate about the transformation strategies of an ecologically and socially destructive capitalism outside the classical canon and gate-keeping organs of sociology (Adloff/Neckel 2019, Saitō 2022, Bruckmeier 2016, Brand/Wissen 2024, Gottschlich et al. 2022, Huber 2022, Klein 2015, Moore 2016, Schaupp 2024). Several of these debates analyse the ecological crisis through (neo)materialist perspectives on the political ecology of capitalism, engaging with Marx’s diagnosis that capitalist accumulation and expansion create and intensify a metabolic rift between humans and nature, contributing to the crisis (Marx 1978). Contemporary debates from a Marxist political ecology agree that this metabolic rift creates an ecological contradiction that is inherent to the capitalist mode of production, since it structurally relies on the extraction of natural resources. This ecologically liminal state of contemporary capitalism (Brand/Wissen 2024) therefore requires a critical reorientation regarding its exploitation of labour and nature (Schaupp 2024: 14–16), as well as possible transformation strategies, such as ecosocialism or degrowth communism (Saitō 2022, Moore 2016).

In addition to the more prominently analysed contradiction between labour and capital within capitalism, in the context of an aggravating climate crisis and incremental episodes of ecological collapse throughout the globe, this creates scenarios of increasing ‘socio-ecological transformation conflicts’ (Graf et al. 2023, translated by S.G/A.S.). Hereby, although the ecological crisis is not the immediate cause of these conflicts, it creates a social, political, and economic figuration in which different actors struggle over different ways of confronting it:

‘Ecological distortions and reform efforts meet social contradictions, potential for conflict, or already manifest conflicts with which they interact. They combine with unequal class and gender relations, racist discrimination and neo-colonial North-South relations and thus result in transformation conflicts.’ (Graf et al. 2023: 7, translated by S.G/A.S.)

These socio-ecological transformations bring into

5 In the sense of Bruno Latour (2017).

6 Diekmann (2024: 5, translated by S.G/A.S.) sustains this claim in reference to the archive of the German-speaking sociological journal, *Zeitschrift für Soziologie*, which he sees as a ‘mirror of sociological research in Germany’. Looking at approximately 1,300 articles since its foundation in 1972, Diekmann comes to the following conclusion: ‘The proportion of articles in the *Zeitschrift für Soziologie* dealing with the environment and ecology in the broadest sense remained at a per mille level during the three decades between the journal’s founding and the turn of the millennium. This period encompassed the mass protests against nuclear power, the founding of the [German] Green Party, the debates on the limits to growth and sustainability, the Chernobyl disaster, and the climate conferences in Rio and Kyoto’ (Diekmann 2024: 6, translated by S.G/A.S.).

question, among other things, the alternative developmental trajectories through which society as a whole may organise its future. In the present constellation, two powerful and competing narratives include the vision of a technocratically modernised green capitalism on the one hand and counter-hegemonic tendencies and movements towards climate and environmental justice on the other.⁷

Such competing imaginaries of socio-ecological transformation materialize within concrete socio-political and spatial constellations, where they become contested terrains of struggle. One historical but nevertheless ongoing constellation is what has been analysed as *extractivism*, eventually the most direct form of the Marxian metabolic rift. The term *extractivism* originates from critical research, primarily in Latin America, emphasising ‘the exploitation of increasingly scarce, mostly non-renewable natural resources and their expansion into previously deemed “unproductive” territories’ (Svampa in Hamilton/Trölenberg 2023: 207).⁸ The exploitation and commodification of natural resources associated with the continuous intensification of extractivism include *ecocide*, the systematic destruction of ecosystems to such an extent that the peaceful use of an area by its inhabitants is impaired (Higgins 2015, Dunlap/Brock 2022), as well as *terracing*, the violent appropriation and destruction of territories, bodies, and knowledges, mostly of indigenous populations (Habersang 2025). The first empirical chapter of this contribution adopts the concept of extractivism, hitherto developed as a critical term for contexts in the Global South, to showcase how similar dynamics are also relevant in the Global North. While extractivism mostly refers to a particular model of accumulation within a capitalist economy, we understand an

extractivist figuration as a specific, localisable, and territorially limited expression of a transnational extractivist industry that is exploitative of humans and more-than-humans alike. This localised figuration is connected to its global and transnational dimension but retains a partial autonomy in its specific context, determined by its concrete social, political, and eco-systemic conditions. In our case, the transnational extractivist industry is the globalised sand and gravel economy, whose local figuration contributes to the destruction of a protective forest, which is countered by occupations and protests.

To bring these two theoretical strands together, analysing socio-ecological transformation conflicts through posthumanist and relational-ontological perspectives in the present contribution ‘implies realizing that disputes about access to and control over natural resources are ultimately about the disruption of relations with nonhuman beings induced by environmental destruction and displacement’ (Flemmer et al. 2024: 615). Here, this disruption is created, in the first place, through the extractivist figuration within a globalised sand and gravel economy and its specific exploitative relation to the more-than-human world. In accordance with contemporary contributions from Marxist political ecology, we hereby highlight the urgency of studying how capitalism creates and perpetuates a metabolic rift within human and more-than-human relationships, in our case expressed by the destruction of a protective forest for the sake of sand and gravel extraction. By being inhabited, the forest is removed from the capitalist dynamics of exploitation and valorisation and rendered ‘unproductive’. In that vein, one could say that occupying a forest helps the forest to go on strike. In doing so, forest occupations resist the destruction and intervene in the disruption of extractivist practices, suggesting a different way of being and protesting with the forest and its inhabitants through more-than-human figurations of solidarity.

Thus, the following entangled three figurations (of extractivism, solidarity, and repression) compose an overarching more-than-human figuration in occupied forests. This more-than-human figuration en-

7 These two directions were presented by Maristella Svampa as part of four competing narratives about and within the climate crisis in the present at the 5th Forum of Sociology of the International Sociological Association in Rabat, Morocco on July 12, 2025.

8 Recent debates oftentimes speak of *neo-extractivism* – a socio-economic constellation in which mostly progressive governments in Latin America deepen extractivist endeavours in order to promote and finance the national welfare state and social distribution programs (Gudynas 2013, Brand 2016).

compasses practices of extractivism, solidarity, and repression in the same specific setting, showcasing the heterogeneous entanglements between local sand and gravel companies, squatters, animals, and other more-than-human inhabitants of the occupied forest. We conceptualise these forests as ‘sites of dissent’ (Starodub 2021) and a ‘contested territorialisation’ (Terra-R Autor*innenkollektiv 2025: 29, translated by S.G/A.S.) against extractivist practices, which perpetuate violence against human and more-than-human bodies, entities, and territories alike.⁹

2. Methods and Data

Our methodological design comprises the ethnographic and participatory weaving of a string figure that is composed of three figurations depicting a snapshot of how more-than-human figurations in occupied forests in Germany¹⁰ prefigure ‘possibilities of life in capitalist ruins’ (Haraway 2016: 37). According to Donna Haraway, string figures are ‘like stories; they propose and enact patterns for participants to inhabit, somehow, on a vulnerable and wounded earth’ (Haraway 2016: 10). They can be turned into a ‘techné’ (Menaude et al. 2020: 7) – at the same time a technique of theorising and a method for knowledge production. In our case, three subsequently presented figurations will be woven into a string figure at the end of this article. This is the result of a connotative movement between associated elements (Deleuze/Parnet 1987: 34), in which we are becoming part of experiences with particular individuals,¹¹ transforming and recycling materials and matter, and entering into relations with more-than-human beings in the forest,

such as trees and toads.

We employ a variety of instruments from the methodological toolkit of empirical social science research and ethnography, collecting stories and testimonies with and from the forest inhabitants we consider to be our co-researchers – including squatters in the forest occupations and members of citizens’ initiatives and NGOs – through narrative interviews, informal conversations, and storytelling. Our empirical material therefore comprises numerous informal conversations with squatters (self-proclaimed ‘forest people’) and supporters of past and ongoing forest occupations in Germany, activists from the *Wald statt Asphalt* (Forest Not Asphalt, WsA hereafter) initiative, expert interviews with regional forest rangers and representatives of the *Bund für Umwelt und Naturschutz in Deutschland* (Federation for the Environment and Nature Conservation in Germany, BUND hereafter), and a group discussion with members of a local citizens’ initiative resisting sand extractivism.

At the same time, we have been writing research diaries and *ex post* field notes. Our concrete methods for knowledge creation in occupied forests were fitted to the situatedness of participants’ knowledge and not determined in advance to be able to trace emerging and entangled strings of ‘relation-making forces’ (Tsing 2015: 123), which create ‘interwoven structures’ (Elias 2012: 128) through the re-entanglement/re-assemblage of a ‘more-than-human sociality’ (Tsing 2015: 152). In our methodological design, we are employing string figures as a technique and techné based on a relational ontology that understands the realities of existence through relationality (Sheppard 2008, Stengers 2019) to generate connectivity in and through narration.

In the weaving of string figures, analysis and practice are thus simultaneous movements of connectivity through narration – a ‘practical science’ (Deleuze 1980: 1) that analyses while doing and telling stories about practices. In the subsequent sections, we will present these more-than-human figurations that we conceive as located in environmental conflicts around forest occupations. Conclusively, we will be

9 We adapt this idea from indigenous feminist conceptualisations surrounding the notion of *cuerpo-territorio*, which describes how colonisation, land-grabbing, and extractivism affect both territories and (female and indigenous) bodies (Cabnal 2010).

10 In the area of the forest of Dannenrod in winter 2020 and in the forest of Langen between autumn 2024 and spring 2025.

11 We have closer relationships with some of them than with others; likewise, some are more involved in the research process than others.

weaving these narrational nodes into the strings of a figure which allows us to see what is in between the associated elements and to point out new possibilities (Deleuze/Parner 1987: 36 ff.) of re-assembling and caring about future life within a more-than-human sociality on a damaged planet.

3. Extractivist Figurations

The aim of the following section on sand and gravel extractivism, the first of three empirically detailed figurations, is to lay the ground for the more-than-human figurations in occupied forests, figuratively and literally. This is because, as we will show, most of the forest occupations in recent years have been resisting projects of the fossil infrastructure (e.g. the expansion of highways, urbanisation projects) to which the sand and gravel industry is fundamental (again, figuratively and literally). Despite this material connection, environmental conflicts surrounding sand and gravel extractivism in Germany have only been addressed in newspaper reports (e.g. Arnold 2024 or Scherer 2025) but have not received any scholarly attention so far. Also, a broader 'literature review on sand revealed a knowledge gap on the sociopolitical processes entangled with and triggered by its extraction and consumption' (John 2021: 5). In contrast, the most emblematic forest occupations in Germany protested the extension of open-cast lignite mining (the forests at Hambach or the village at Lützerath) or the construction of highways (the forest of Dannerod) (see, for example, Kaiser 2020, Brock/Dunlap 2018, Mohr/Smits 2022, Liersch/Stegmaier 2022). Our empirical point of departure, the forest occupation in the protective forest in the city of Langen, located south of Frankfurt, invites us to follow up on their resistance against local expressions of an ecologically destructive global sand economy.¹²

But why does sand (and gravel) matter? To begin with, a brief review of media reports from recent years re-

veals warnings and investigations about global sand shortage, disappearing beaches, and illicit mining and traffic. Reports by the United Nations Environment Program (UNEP 2019) and the Geoinformation Service of the German Military (Kräutner et al. 2022), for instance, point towards an increasing awareness of its geopolitical significance. These reports reveal some insightful initial facts about sand (and gravel): in monetary value, across the globe, around USD 70 billion is spent on sand every year; it is dug up on every continent, especially in riverbeds; and there are important differences in its quality. For example, sand with a high percentage of quartz, as in our case, is much rarer and therefore more profitable. Reviewing data about the global sand economy reveals that sand is the world's most extracted mining product, second only to fossil fuels in revenue (Schaupp 2024: 293–95). Statistics about global raw material extraction growth from 1970 until today further highlight the disproportionate rise in non-metallic minerals like sand, gravel, and lime, now making up about half of all extraction (Material Flows 2025). Sand is mostly required to produce concrete, the basic building material of our time. The concrete-producing industry alone is accountable for approximately 8% of the global CO₂ output (Schaupp 2024: 294). According to the Harvard Atlas of Economic Complexity (Harvard Growth Lab 2025), the top exporters of natural sands in 2022 were the USA (26.78%), Australia (10.03%), the Netherlands (9.75%), and Germany (6.98%). Another study (Mia et al. 2026: 7) concludes that 'the United States, the Netherlands, Germany, Belgium, and Malaysia rank as the top five countries worldwide in terms of sand exports. A glimpse into the future warns that the rising demand for non-metallic minerals, particularly due to urbanisation and infrastructure development, is expected to double (from approximately 25 gigatons per year today). This could drive ecosystems towards irreversible damage, heightening fears of global sand shortages and potential social conflicts (Torres et al. 2021: 640).

The sheer amount of sand extracted across the globe makes it a proper anthropogenic factor – a crucial impact of human activity on the global eco-

¹² We would like to thank the citizens' initiative at Schaafheim, especially Sabine Schwöbel-Lehrmann, whose film *Knirschendes Gold* (Crunchy Gold) has been an important entry point into this topic.

logy (Torres et al. 2021, John 2021). Humans are estimated to move twice the amount of sand that is transported as sediment by all rivers in the world (John 2021: 3). But despite its geological as well as anthropocentric relevance, sand, and particularly its political ecology, remains surprisingly understudied in the humanities. This goes hand-in-hand with ‘its perception as a universal, readily available, cheap and conflict-free construction material’, which in turn ‘is continuously driving its extraction’ (John 2021: 2). While some studies do acknowledge the potential for social, political, and ecological conflicts around sand extraction, they do so by focusing mostly on illicit ‘sand-grabbing’ in countries of the Global South, such as Malaysia, Indonesia, India, Bangladesh, Vietnam, or Cambodia (Bisht 2022, Mia et al. 2024, Lamb et al. 2019). According to the Global Atlas of Environmental Justice (Ejatlas 2025), today, there are at least 130 cases of environmental conflicts around sand and gravel across the globe. While these investigations are, without any doubt, important, we want to argue that the export numbers mentioned above demand a closer and more critical attention to sand and gravel extractivism in the Global North.

For the case of Germany, we can observe a significant increase in the amount and share of sand and gravel extraction between 1998 and 2024 (Material Flows 2025). While in 1998, sand and gravel made up approximately half of all extracted non-metallic minerals, they dominated the sector by 2024 (Material Flows 2025). In Germany, there are over 2,200 sand and gravel extraction sites, located mainly alongside and within rivers. Zooming into the quartz-rich sand deposits south of Frankfurt, there are at least 11 disputed extraction (mostly wet mining and one dry mining) sites near Langen in the west and Schaafheim and Babenhausen in the east, mostly within intact forests, or even, as in the case of Langen, so-called protective forests. The companies involved in the local sand industry are Sehring and Foca Group. Sehring, in particular, is the main addressee of criticism surrounding the resistance to sand and gravel extractivism around Langen. According to our sources at BUND, within its surrounding protective forest, we can observe a con-

tinuous growth of the local open-cast, wet mining site from one hectare in 1939 up to the currently disputed extension of approximately 63.7 hectares, reaching a total extension of approximately three square kilometres.

The increase in sand and gravel extraction in Germany is often explained by the demand of the local construction and housing industry, advocating for domestically extracted sand as more ‘sustainable’. Nevertheless, the basic assumption about a domestic shortage in sand that would legitimise further extraction is wrong. Reports and investigations concur that ‘[i]n Germany, the consumption of construction sand does not yet exceed the extraction rates’ (Kräutner et al. 2022: 28, translated by S.G/A.S.), so there is ‘no geological shortage’ of quartz and construction sand (Elsner 2018: 6–7, translated by S.G/A.S.). Comparing the national growth of newly constructed houses with the growth of sand extraction in Germany historically indicates that the local demand of the construction and cement industry can be met with the sand from existing pits. Consequently, since the number of new buildings in Germany is growing considerably slower than sand and gravel extraction, the extracted resources must be used for export. Accordingly, for the case of Langen, a study from BUND (Göbel 2020) found that the regional demand for raw materials can also be met without the disputed and resisted expansion of the pit near Langen and that ‘[t]he high-quality quartz sands extracted in the defendant’s [Sehring] opencast mine are undoubtedly not predominantly used for the use provided for in the Federal Mining Act’, namely to secure the local demand (Göbel 2020). This has even been acknowledged by the company itself.

The presented numbers, as well as the snapshot of a disputed extraction site, show how sand and gravel extractivism is a fundamental driver of the expansion of the fossil infrastructure in Germany. It is also connected to other environmental conflicts because it provides the material basis for the construction and concrete industry within disputed projects, such as the Western Runway of the Frankfurt Airport (in the 1980s); the contested con-

struction of Highway A49 in the state of Hess, which was resisted in the forest occupation of Dannerod Forest in 2019; and the ongoing/beginning conflict over the expansion of Highway A5 near Frankfurt. It is further connected to other struggles because sand and gravel are being used to backfill other mining projects, connecting the ongoing occupation at Sündenwald to the heavily disputed extension of an open-cast lignite mine in Hambach in North Rhine-Westphalia. Finally, excavated mining sites are being used to deposit, eventually ignoring ecological standards, building scrap for which extraction companies receive money.

This supports the argument that the domestic sand and gravel industry is not only connected to several environmental conflicts across the country, but that it is a local figuration of a *global extractivism* (Chagnon et al. 2022). While ongoing research on the evolving global political economy amidst the climate crisis primarily examines resource extraction for the so called ‘green modernisation’ (e.g. lithium), we argue that sand and gravel extraction is a more classic case of extractivism on a global scale that deserves our attention, both in terms of its status as a globally interconnected extractivist industry as well as its local expressions in concrete case studies. It is global, first, because of its anthropogenic force throughout the planet and, second, because it connects territories in the Global North and South around the same resource, producing relations of exploitation involving minerals, rivers, forests, and humans. It ‘conditions, constrains, and pressures (organizes) the everyday lives of most humans and more-than-humans everywhere, but in different degrees and ways for people in different societies and societal roles’ (Chagnon et al. 2022: 767).

4. Figurations of Solidarity

In Germany, the extractivist sand and gravel figurations intersect with the more-than-human figurations of solidarity between humans, forests, and forest inhabitants in order to protect forests against

land- and sand-grabbing or the expansion of fossil infrastructure.

Forest occupations have a long tradition in the German climate justice movement, dating back at least to the occupation of the Flörsheim Forest southwest of Frankfurt in the 1980s, where protests against the expansion of Frankfurt Airport – specifically, the construction of the Western Runway (Startbahn West) – reached their peak. Sparked by plans to clear approximately 300 hectares of protective forest and lay down four kilometres of concrete, opposition had already begun as early as 1965. In order to be able to cut down the protective forest, the highest category of a protected forest in Germany, the forest law of the state of Hess had to be changed in a way that ensured that ‘[t]he complete or partial cancellation of a declaration of protective forest’ was only permissible if it concerned ‘projects of raw material extraction of supra-regional importance’ or ‘other projects of supra-regional importance’ (Hessisches Waldgesetz [HWaldG] 2013: §13, translated by S.G/A.S.). The airport fell under the latter category, and it is the same legal loophole that allows the deforestation at ‘Banny’, our case study,¹³ today.

The most emblematic expression of the resistance against the expansion of the airport was the foundation of the so-called Hüttendorf (hut village) in 1980, evicted only one year later through heavy police repression. The Hüttendorf is a crucial precursor for today’s forest occupations, particularly regarding the protest strategies that were employed there: forest occupations as a follow-up strategy when legal means, e.g. petitions, have been exhausted; architecture as a means of resistance; so-called Sunday or forest walks (*Sonntags* or *Waldspaziergänge*) to inform citizens and neighbours and to win their support; as well as protest and resistance as the creation of an alternative community, a prefiguration of relations of solidarity in the midst of a forest.

In the 21st century, forest occupations have been

13 Its name was adapted from the legal German term for a protective forest, *Bannwald*, and was shortened to Banny as a term of endearment by the forest occupation.

taken up again as a protest strategy for example in 2012, during the occupation of Hambach Forest against the extension of the open-cast lignite mine, run by the German energy company RWE, in the state of North Rhine-Westphalia. The forest occupation, called ‘Hambi’ by the squatters, started in 2012 and was followed by protests against the expansion of the mine in Lützerath and Sündenwald Forest (another recently evicted occupation, coined Süнди). This site of dissent, and especially the forest of Hambi, represents an important ‘symbol of the German climate [justice] movement’ (Kaiser 2020, translated by S.G./A.S.) as well as a crucial territory of socio-ecological transformation conflicts in Germany (Brock/Dunlap 2018, Mohr/Smits 2022, Liersch/Stegmaier 2022).

The protests against the construction of the highly disputed Highway A49 through the Dannerod Forest (Danni), occupied from 2019 until the end of 2020, comprise another important figuration of solidarity with forests in Germany. Not only was it one of the largest forest occupations until the present since the Hüttendorf, with more than 100 treehouses and 400 barricades, but it also managed to resist eviction for more than 30 days. Despite its eviction, the figurations of solidarity at Danni were a nodal point of a rhizomatic extension¹⁴ of forest occupations in Germany, particularly as the founding moment of the WsA alliance.¹⁵

Despite its eviction, according to the alliance, the occupation at Danni ‘was also a new beginning for many people who were active there, and there was

a saying that caught on at the time: “They tried to bury us; they don’t know we were seeds” (Wald Statt Asphalt 2024). Activists, squatters, and self-defined ‘forest people’ from Danni and elsewhere were ‘scattered like seeds in the wind to many new places, where they planted forest occupations or sprouted from the ground’ (Wald Statt Asphalt 2024). According to our own research, since 2012, there have been several dozens of forest occupations across Germany, defending forests against sand and gravel (5), coal (3), and lime (1) extraction; expansion of highways (6) and infrastructure (4); and urbanisation projects (5). The occupation near the city of Langen is one of these seeds.

Scholarly interest in forest occupations in Germany has interpreted these events as negotiations about energy transition (Mohr/Smits 2022, Liersch/Stegmaier 2022, Kaiser 2020), as conflictive and repressive episodes (Brock/Dunlap 2018, Haudenschild et al. 2023), as well as ‘forest conservation politics from below’ (Kaufer 2022). In these debates, the more-than-human figurations within forest occupations have received little attention, highlighting the occupations’ ‘critique of anthropocentrism’ (Hamilton/Trölenberg 2023: 219) as well as the involved ‘relationships of care between plants and humans’ (Lehečková 2023). This contribution seeks to put such insights at the centre of our understanding of forest occupations as a more-than-human figuration of solidarity through a posthumanist and relational-ontological perspective on environmental conflicts. This is because, we argue, forest occupations are much more than traditional arenas of political negotiations, expressions of certain ideologies, or conservation politics. Instead of simply reacting to environmental harm, forest occupations actively counter the erosion of relationships with more-than human beings brought about by ecological destruction and displacement. These practices introduce new modes of dwelling in and resisting alongside the forest and its inhabitants, gradually reconfiguring how humans relate to the ecology of forests in the context of accelerating ecological crisis.

A few examples from our ongoing research illumi-

14 For more, see Deleuze and Guattari (2005) – the concept of the rhizome has been adapted in social movement and solidarity studies in a variety of cases and theoretical debates (Conway et al. 2018, Garbe 2022, Khasnabish 2013).

15 In their own words: ‘The [...] alliance was founded in 2020 during the conflict over the Dannerod Forest and made a significant contribution to the Danni becoming a nationwide symbol of the fight against the destruction of our nature for economic interests [...]. Since then, initiatives and forest occupations have formed in many places to actively oppose the destruction of our natural resources. Today, WsA connects these diverse protests nationwide and also supports them with material donations, action training, skillshares, workshops, reporting and digital outreach’ (Wald statt Asphalt Bündnis 2025, translated by S.G./A.S.).

nate this argument. On a symbolic level, we agree that '[forest] protesters criticised the anthropocentric distinction between humans and nature and the implicit hierarchy that places humankind above nonhuman nature' (Hamilton/Trölenberg 2023: 219). This includes addressing the forests through terms of endearment (Hambach Forest became Hambi, Danne-rod Forest Danni, the protective forest Banny, etc.) or holding funerals for trees, which 'questions the view that humans and nature are to be seen as separate entities' (Hamilton/Trölenberg 2023: 220) and highlights their more-than-human figuration.

Besides this more symbolic critique of anthropocentrism, in our own research, particularly through conversations with squatters during occupations, such figurations of solidarity appear as concrete practices between species. For example, the experience of relations of mutual care and affinity led to the following statement by a squatter in Dannenrod: 'I felt as if the other people in the *barrio* were an extension of myself'. In another conversation, Silhouette¹⁶ described how they learned to obtain water from the forest (instead of always carrying water on bikes into the occupation), how their bodies adapted to the cold during the winter months, and how they engaged in caring relationships with nonhuman squatters, such as bats or dormice.

Collecting and sawing thick and stable branches and recycling wooden planks from the edges of the forest, fitting them between the branches of an old tree in the middle of the forest to have a platform to sleep right next to the trunk, 15 to 20 metres above ground, falling asleep dangled by the movements of the tree in the wind – these practices and experiences of 'making-kin' (Haraway 2016) with the forest and its old and new inhabitants have taught us to pay particular attention to the formation of new alliances and assemblages, both between humans and humans as well as humans and their more-than-human environment, when carving out figurations of solidarity. What is more, the forest occupations support each other across different territories, creating a

more-than-human figuration of solidarity between forests. The most pointed expression of such a solidarity was a meme created and distributed within the social media channels of the occupations, when the cover of a popular children's book, *Hanni and Nanni*, was recreated as *Hanni and Banni*. The subtitle of the original novel, 'best friends stick together', was altered to 'forests stick together'.

Insights from posthumanism and relational ontology help to decipher the meaning behind one famous slogan in German forest occupations: 'We are nature protecting itself!' The described symbolic forms and practices of solidarity within and between forests are mediated, communicated, and enacted by humans in their very awareness of their distinctive humanness within a relational ontology. Accordingly, we do not wish to argue that forests 'behave' like humans or that humans 'act' like trees or toads. Rather, these examples show that forest occupations represent a social constellation that needs to be understood as a more-than-human figuration of solidarity and, therefore, as a 'more-than-human sociality' (Tsing 2015: 152).

5. Repressive Figurations

The last part of this contribution brings together the extractivist figurations and shows how they interrupt and repress – in the sense of 'the disruption of relations with nonhuman beings induced by environmental destruction and displacement' (Flemmer et al. 2024: 615) – the more-than-human figurations of solidarity between forests, humans, and animals described in the previous section. We will highlight such repressive figurations, as we call them, by looking at the destructive and repressive effect open-cast sand and gravel mining has on the local forests south of Frankfurt, as well as on those who strive to protect them.¹⁷ This last figuration therefore showcases the co-existence and co-presence of ecological destruc-

¹⁶ Name changed for anonymisation purposes.

¹⁷ This is largely based on participatory action research, including interviews in the region with environmental NGOs, citizens' initiatives, rangers, and forest occupations.

tion, ecological resistance, and the repression against climate justice activism in the same territory, highlighting that '[t]he place of extraction is no longer "empty"' (Hamilton/Trölenberg 2023: 219) and that it has turned into an antagonistic space where relations of solidarity are attempted to be put into practice through the prefiguration of (inter-species) horizontal relationships and articulations of socio-political dissent (Starodub 2021: 16 ff.).

We begin with a brief overview of the repressive figurations: the negative environmental impact local sand and gravel extractivism has on the more-than-human environment. This includes the loss of forests, depletion of groundwater resources, and threats to local wildlife and fauna. According to our sources at the local branch of BUND, in the protective forest in Langen, for example, trees that harbour bat caves have been destroyed. What is more, in the whole area, more than 50 strictly protected or critically endangered species would need to be moved or killed to make way for gravel extraction. Further, the extraction process increases the risk of landslides, one of which almost killed two fishermen by the pit near Babenhausen. Other ecologically destructive consequences of open-cast mining are so-called 'edge effects' of the forest surrounding the pits. Due to direct sun exposure, trees suffer from heavy sunburn damage, and it is possible to see with one's own eyes that the trees next to a more recent pit are healthier than the ones covering an older excavation site. Additionally, the so-called 'bathtub effect' sucks the ground- and rainwater from nearby ecosystems into the gravel and sand pits, which lie considerably lower than the soil of the forests. These are just a few of many possible examples of how extractivism represses the survival of more-than-human beings in the forest south of Frankfurt. However, repressive figurations also suppress the solidarity between humans and more-than-humans in their attempts to prefigure collective survival.

The kind of repression targetting environmental NGOs, citizens' initiatives, and forest squatters in our case study must be understood in the broader context of growing repression against ecological activism

in Germany (Green Legal Impact Germany e.V. 2025, Brock/Dunlap 2018, Bönemann 2023). In this context, repressive counterstrategies force their targets to explore new ways of resisting and existing – and in doing so, to form new alliances with human and more-than-human actors in the strings woven in figurations of solidarity. In our case study, so-called SLAPP (strategic lawsuits against public participation) lawsuits employed by Sehring against any critique of their enterprise have been targeting one local politician due to his prominent and outspoken criticism of local sand and gravel extractivism. Similar lawsuits have been brought against BUND, which is equally critical of extractivist practices in Langen. These lawsuits oftentimes only target small critical comments, remarks, or even likes on social media, and seek to tie up the financial or organisational resources of ecological activists by accusing them of slander or glorifying violence.¹⁸

But such experiences of political repression do not exhaust or extinguish resistance or solidarity. Rather, the repressive figuration provides a fertile ground on which more-than-human alliances can re-emerge. We experienced such an episode on an autumn day at the picket held at the edge of the forest occupation in Banny, over a cup of coffee with home-made vegan cake, when the outspoken local politician informed forest squatters who had just climbed down from a treehouse about the newest legal battles he was having with the local authorities. As he shared his mental load with the squatters, they told him about the edible vegetation they discovered in the occupation and the kinds of support they needed in order to make the treehouses waterproof.

In the strings of narration of repressive figurations, humans discover the diversity of worlds repressed in these figurations. Repression is directed not only at the gently swaying constructions and the bird habitats the forest squatters find high in the treetops,

18 Through one such lawsuit, a local mining company tried to stop the screening of *Crunchy Gold* in a movie theatre in Frankfurt that was organised by local environmental activists in order to inform the broader public about the effects of extractivist practices.

which are threatened by extractivism. The socio-political articulation of dissent expressed through the formal work of environmental actors and politicians is also entangled in and re-assembled through repressive figurations. They include the coming together over a movie night of local inhabitants concerned by forced resettlement, the loss of livelihoods or access to food or water, and ecosystems such as forests, as well as the displacement and severe exposure to pollution resulting from infrastructure or its construction (Haudenschild et. al. 2023) due to extractivist practices and the new alliances and collective agencies that could emerge here.

Such practices amount to what Brock and Dunlap call ‘corporate counterinsurgency’ (Brock/Dunlap 2018) within socio-ecological transformation conflicts. We were given various examples of such ‘soft’ strategies of corporate counterinsurgency where local mining companies sponsor local football clubs and infrastructure, and, as a result, create influence and dependencies. Also, in order to win ‘the hearts and minds’ of the local population, in several instances, deceptive or false information was handed out, for example about the actual extent of the extension of the pit.

As new forming ‘counter-communities’ (Loick 2024, translated by S.G/A.S.) consisting of previously unlikely alliances emerge in the strings and between the lines of repressive figurations, a string figure of alternative futures in occupied forests comes to the forefront. In this string figure, new paths for collaboration between different disciplines and species, and the production of new connections and alliances runs through the materiality of lives in the *barrios* of the occupied forests.

Here, humans are gathering dead leaves from the ground in order to use them for the dry compost toilet of their *barrio*. This practice allows them to make-kin with the forest, to entangle with its humus-creating, fertile (instead of damaged) soil so it can remain a home for everybody, for the moles, the toads, the plants, and the insects collectively re-creating the forest. We can trace the storylines of the collective making of these infrastructures (also including

blogs, websites, and social media channels to share information about the effects of extractivism and to organise against it) to the notion of ‘undercommons’ (Harney/Moten 2013) – resources that have been collectivised in defiance of the status quo, of the extractivist and the connected repressive figurations. We can trace these strings to the emergence of counter-communities making use of these resources that have transformed their relations of possession regarding the environment and turned into ‘nature defending itself’ (Hamilton/Trölenberg 2016). In the string figure of alternative futures in occupied forests woven in this way, the counter-community emerges as a collective actor refusing its exploitation and oppression in contention with the status quo (Loick 2024: 17).

6. Conclusion

After the toad fence was finished in early 2025, on some occasions, small segments have been destroyed and ripped open. It was no surprise to the squatters that they were the first to be accused of having vandalised the fence. But without ever finding out who had done it, they were also the first to repair the destroyed segments. It was clear to them that while the toad fence is only a small fig leaf of the environmental destruction that will soon take place, they still felt responsible for the toads having access to a safe passage out of the designated clearing area.

There are strings of narration that connect the extractivist figuration – producing relations of exploitation involving minerals, rivers, forests, and humans on the entire planet and, at the same time, producing sites of dissent where living beings refuse to be exploited – to the figurations of solidarity depicted in this article, producing connections between these sites as well as between the different elements that are part of each site of dissent in forming ‘counter-communities’ (Loick 2024, translated by S.G/A.S.) in the face of repressive figurations. After having carved out these three figurations, the string figure of alternative futures in occupied forests emerges as a snapshot of the struggles to come in the rhizome of interwoven more-than-human relations seen

through the lens of a relational ontology.

Rooted in environmental protest sites of dissent, in occupied forests, entangled with their matter and inhabitants, this counter-community profits from the dynamism of thought in the production of new alliances through string figures as techné. Relating to the string figures that Donna Haraway has woven in her book *Staying with the Trouble* (2016), our string figure does not offer an escape from the crisis-ridden reality through technological fixes or a dystopian finality. Instead, it suggests a method for working together, for collaborating in the creation of futures for every living being, for continuing to inhabit the trouble, which includes, among many other future-oriented practices of communisation, continuously repairing the toad fence.

Other strings departing from the three now connected more-than-human figurations can be seen entering into conversation with Bruno Latour and Nicolaj Schultz, when they conceive an ecological class in order to offer descriptions of new possibilities of alliance and cooperation (2022: 13) in counter-communities. In pointing out that the notion of class traditionally depicts a project of social transformation and turning towards the contentions to come evolving around questions of political ecology, they ask: '[W]ho is your kin?' (Latour/Schultz 2022: 13–15, translated by S.G/A.S.).

Seen through the lens of a relational ontology, the ecological class is a new alliance, a new kinship formed through more-than-human sociality and collectively transformed matter (Folkers 2013: 25 ff.). So, who is your kin with whom to survive on a damaged planet: the gravel pit or the humus in the compost toilet? The local sand and gravel company or the toad in the forest?

In our string figure, the counter-community of an ecological class urges us to answer the question of kinship in the ecological crisis in collective, horizontal, and prefigurative terms. Situated in the forest occupations of the present, where possibilities of more-than-human alliances are currently sprouting, it is a fragment of a rhizome of alternative futures under threat of eviction, in which storylines connect figurations.

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