

Radical social innovations and the spatialities of grassroots activism: navigating pathways for tackling inequality and reinventing the commons

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Abstract

In this article, by drawing on empirical evidence from twelve case studies from nine countries from across the Global South and North, we ask how radical grassroots social innovations that are part of social movements and struggles can offer pathways for tackling socio-spatial and socio-environmental inequality and for reinventing the commons. We define radical grassroots social innovations as a set of practices initiated by formal or informal community-led initiatives or/and social movements which aim to generate novel, democratic, socially, spatially and environmentally just solutions to address social needs that are otherwise ignored or marginalised. To address our research questions, we draw on the work of Cindi Katz to explore how grassroots innovations relate to practices of resilience, reworking and resistance. We identify possibilities and limitations as well as patterns of spatial practices and pathways of re-scaling and radical praxis, uncovering broadly-shared resemblances across different places. Through this analysis we aim to make a twofold contribution to political ecology and human geography scholarship on grassroots radical activism, social innovation and the spatialities of resistance. First, to reveal the connections between social-environmental struggles, emerging grassroots innovations and broader structural factors that cause, enable or limit them. Second, to explore how grassroots radical innovations stemming from place-based community struggles can relate to resistance practices that would not only successfully oppose inequality and the withering of the commons in the short-term, but would also open long-term pathways to alternative modes of social organization, and a new commons, based on social needs and social rights that are currently unaddressed.

Keywords: Social innovation, grassroots activism, commons, environmental justice, social justice, social-environmental movements, resistance, reworking, resilience

Résumé

Dans cet article, nous utilisons des preuves empiriques provenant de douze études de cas dans neuf pays du Sud et du Nord, pour demander comment les innovations sociales radicales de la base qui font partie des mouvements et des luttes sociales peuvent offrir des voies pour s'attaquer aux inégalités socio-spatiales et socio-environnementales, et réinventer les biens communs. Les innovations sociales radicales à la base sont des pratiques initiées par des initiatives formelles ou informelles dirigées par des communautés et/ou des mouvements sociaux, visant à générer des solutions nouvelles, démocratiques et justes sur le plan social, spatial et environnemental. Elles répondent à des besoins sociaux qui sont autrement ignorés ou marginalisés. Nous nous appuyons sur le travail de Cindi Katz pour explorer comment les innovations de la base sont liées

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aux pratiques de résilience, de remaniement et de résistance. Nous identifions leurs possibilités et leurs limites, ainsi que leurs modèles de pratiques spatiales et leurs voies de re-scaling et de praxis radicale. Nous découvrons des ressemblances largement partagées entre différents lieux. Notre objectif est d'apporter une double contribution à la recherche en « political ecology » et en géographie humaine sur le militantisme radical de base, l'innovation sociale et les spatialités de la résistance. Premièrement, révéler les liens entre les luttes socio-environnementales, les innovations populaires émergentes et les facteurs structurels plus larges qui les causent, les permettent ou les limitent. Deuxièmement, explorer comment les innovations radicales de la base, issues des luttes communautaires locales, alimentent la résistance pour s'opposer à l'inégalité et à l'affaiblissement des biens communs à court terme. Enfin, il s'agit de voir comment des voies à long terme peuvent être ouvertes à d'autres modes d'organisation sociale et à un nouveau bien commun, fondé sur des besoins sociaux et des droits sociaux qui ne sont actuellement pas pris en compte.

Mots-clés: Innovation sociale, activisme de base, biens communs, justice environnementale, justice sociale, mouvements sociaux-environnementaux, résistance, remaniement, résilience

Resumen

En este artículo, a través del estudio de 12 casos distintos de 9 países diferentes tanto del norte como del sur global, indagamos en cómo las innovaciones sociales, de base y radicales, que forman parte de distintos movimientos y disputas sociales nos ofrecen vías para hacer frente a las desigualdades socio-espaciales y socio-ambientales y para reinventar los comunes. Definimos innovaciones sociales, de base y radicales, como un conjunto de prácticas puestas en marcha de modo formal y/o informal por comunidades locales y movimientos sociales, con el propósito de generar soluciones novedosas, democráticas y social, espacial y ambientalmente más justas, que permitan abordar determinadas necesidades sociales, por lo general ignoradas o marginalizadas. Para alcanzar este objetivo, nos apoyamos en el trabajo de Cindi Katz, de cara a explorar cómo las innovaciones de base se vinculan con prácticas de resiliencia, readaptación y resistencia. Identificamos posibilidades y limitaciones, así como patrones de prácticas espaciales, que apuntan a similitudes ampliamente compartidas en distintos lugares. A través de este análisis, perseguimos hacer una doble contribución a la literatura sobre activismos radical y de base, innovaciones sociales y la conexión entre espacio y resistencia dentro del campo de la ecología política y la geografía humana. Primero, buscamos mostrar la conexión entre conflictos socio-ambientales, innovaciones de base novedosas y los factores estructurales que las causan, permiten o limitan. Segundo, perseguimos explorar cómo aquellas innovaciones radicales de base, que surgen de conflictos enraizados en comunidades locales, se relacionan con prácticas de resistencia que no sólo tienen éxito haciendo frente a la desigualdad y la merma de los comunes a corto plazo, sino que también abren vías a largo plazo para explorar modelos alternativos de organización social y nuevos comunes basados en necesidades y derechos sociales actualmente relegados y silenciados.

Palabras clave: Innovación social, activismo de base, comunes, justicia ambiental, justicia social, movimientos socio-ambientales, resistencia, readaptación, resiliencia

1. Introduction

The idea that some kind of shift, construed either as a gradual transition, rapid transformation, or profound structural change, is required to deal with the increasing and combined effects of the economic, climate, energy, food, housing, and now public health crises has become an almost mainstream position (Escobar, 2015; Hickel, 2020; Martin *et al.*, 2020). Academics with different agendas (Asafu-Adjaye *et al.*, 2015; Wilson, 2016), international NGOs (Fuller Transformation Collaborative, 2019), intergovernmental and multilateral institutions (UN's Sustainable Development Goals; World Bank, 2018), grassroots and center-stage political movements (e.g. the Green New Deal in the USA), as well as governments around the globe (e.g. UK's 7 Lenses for Transformation 2018^{2,3}) are offering solutions ranging from purely technocratic or technofuturist (e.g. geoengineering in the USA⁴) to degrowth (Hickel, 2020; see also Kallis *et al.*, 2020) or post-growth economics (Parrique *et al.*, 2019). With the exception of degrowth, most of these initiatives have not so far meaningfully engaged with activist and grassroots initiatives that are currently spreading across the globe carrying the seeds of bottom-up, community-led interventions. As the cases presented in this article show, this gap is important because these interventions have the potential to challenge current socio-environmental and socio-spatial orderings, and to transform local-global geographies. The discrepancy between the on-the-ground experimentation with grassroots innovations and mainstream policies seems even more obvious in the current context of the COVID-19 pandemic. Since the spread of the novel coronavirus (SARS-CoV-2) started, local solidarity initiatives have been emerging across the globe to support the vulnerable and to address the collapse of public health systems and increasing inequality, due to the withering away of the welfare state over the last few decades (Apostolopoulou and Liodaki, 2021; Rose-Redwood *et al.*, 2020). In most cases, these initiatives offer much more concrete and fair solutions than governmental policies have done across the globe.

The inspiration for this article comes, *inter alia*, from the above observation. It also stems from the acknowledgment that the repertoires of social-environmental struggles and movements against rising inequality have shown important signs of moving beyond mere opposition, and towards incorporating in their responses elements of what we term here *radical grassroots social innovations*. We define the latter as a set of practices initiated by community-led initiatives and/or social movements that tend to seek greater autonomy from governments and capitalist interests and aim to generate novel, democratic, socially, spatially and environmentally just solutions to address social needs that are otherwise ignored or marginalized. Our definition draws on the expanding scholarship on grassroots innovations and sustainability transformations (i.e. Daskalaki *et al.*, 2019; Escobar, 2015; Feola and Nunes, 2014; Leach *et al.*, 2012; Pellenc *et al.*, 2019; Seyfang and Smith, 2007; Temper *et al.*, 2018). Its contribution is to consider the following two elements as key in the characterization of any initiative as a manifestation of radical grassroots social innovation. Firstly, the desire to tackle inequality, either in the short- or in the long-term, as part of a broader struggle for communal survival and prosperity. Secondly, its emergence through broader processes of politically progressive and justice-oriented community activism⁵ as a reaction to historical, cyclical or sudden adversity/crisis. We focus on radical grassroots innovations that are a key aspect of community activism (see also Pellenc *et al.*, 2019; Temper *et al.*, 2018) and contentious politics, namely of "concerted, counter-hegemonic social and political action, in which differently positioned participants come together to challenge dominant systems of authority in order to promote and enact alternative imaginaries" (Leitner, 2008, p. 157).

Grassroots innovations committed to social, spatial, environmental and racial justice and broader social-environmental and socio-spatial transformations are not new. As Smith *et al.* (2016) argue, grassroots innovation has historically been a key part of social movements, whether linked to material and economic

² Available at <https://www.gov.uk/government/publications/7-lenses-of-transformation/the-7-lenses-of-transformation>.

³ <https://www.transnational-strike.info/?fbclid=IwAR2IErpAkFZVf2ooUPfQB9BXTei8KIPpp0w3UI-0FCAhfaMkAnZGvCsr-WA>.

⁴ Available at <https://www.sciencemag.org/news/2020/01/us-geoengineering-research-gets-lift-4-million-congress#>.

⁵ We are aware of the fact that "grassroots innovations" from right-wing groups are also active in some local communities. But as these feed back into the capitalist order of uneven dispossession, they are not related to environmentally, socially and spatially just solutions comprising the radical grassroots social innovations we are interested in here.

necessity or fueled by social needs that have been marginalized by the conventional innovation systems of states and markets (Hess, 2007; Seyfang and Smith, 2007; Smith *et al.*, 2014, 2016). However, especially over the last decade, these initiatives have grown significantly. This indicates a systematic effort from grassroots groups and communities to offer a way out from the interrelated crises of capitalism, doing so independently from neoliberal orientated governments and capitalist interests. Their responses have not always been disruptive. Indeed, as we aim to show, radical grassroots innovations may include both short-term improvements and long-term transformations. These may range from attempts to make everyday lives better within capitalism, to revolutionary imaginings, and traveling pathways to post-capitalist societies.

In what follows, we ask how radical grassroots social innovations that are part of social-environmental movements and struggles, many of which emerged at the aftermath of the 2008 economic crash, can offer pathways for tackling socio-spatial and environmental inequality and re-inventing the commons. Our emphasis on the commons stems from the recognition of the need to reaffirm a social space outside of capitalist relations, within which equity and collaborative support can flourish. We imagine this as a collective re-affirmation of human relationships that occur in both physical and digital interactions that we have deemed "the reinvention of the commons." Theoretically, along with the literature on social innovations mentioned above, we draw on critical scholarship on grassroots activism, social-environmental movements and the spatialities of resistance (Cortes-Vazquez and Apostolopoulou, 2019; Featherstone, 2015; Tran *et al.*, 2020; Martin *et al.*, 2020; Martinez-Alier *et al.*, 2014; Nicholls *et al.*, 2016; Pellenc *et al.*, 2019; Scheidel *et al.*, 2020; Temper *et al.*, 2015, 2018) as well as on emerging activist discourses.⁶ By bringing these literatures and discourses together, we aim to contribute in bringing political ecology research on social-environmental movements closer to critical geographical research on social struggles over access to and control of space, place, and territory. We believe this is crucial for linking struggles for nature, space and the commons, and for the right to the city and the right to nature in the current era of a prolonged and combined crisis of capitalism (Apostolopoulou, 2022; Apostolopoulou and Cortes-Vazquez, 2019; Apostolopoulou and Kotsila, 2021; Apostolopoulou and Adams, 2019).

To explore how grassroots innovations relate to practices of purposeful alterity in counterpoint to hegemonic norms and social activities, we use Katz's (2004) analytical distinction between 'practices of resistance, reworking and resilience as a theoretical and a methodological tool.' Empirically, we draw on 12 cases from nine countries that we selected with the aim of moving beyond South/North and urban/rural divides. By drawing on postcolonial geographies (Hart, 2018), countertopography (Katz, 2011) and comparative political ecology (Tran *et al.*, 2020; Taylor and Hurley, 2016), we uncover broadly shared resemblances across places as different as the village of Stagiates in Greece, and the Cabo Delgado province in Mozambique. Countertopographies, similarly to comparative political ecology methods, invoke unexpected connections among disparate places by analyzing case studies from different regions. This allows the emergence of commonalities across space and time, making possible the production of spatialized abstractions that are necessary for grappling with the various ways grassroots radical innovations open pathways to generate novel possibilities for spatial resistances and local-global alliances.

Through our analysis we aim to achieve a twofold contribution to radical political ecology and geographical scholarship on grassroots activism, social innovation and the spatialities of resistance:

1. To reveal the connections between social-environmental struggles (collective action with specific spatial narratives and practices), emerging grassroots innovations (exceeding the limits of the local in their imaginaries and practices), and broader structural factors that cause, enable or limit these struggles.
2. To explore how radical grassroots innovations stemming from place-based community struggles and social movements relate to resistance practices, that not only successfully oppose inequality and the withering of the commons in the short-term, but also open long-

⁶ See for example Transnational Social Strike Platform, The Red Nation, The Transition Network, the #NoDAPL Movement (Estes & Dhillon, 2019) and other similar initiatives.

term pathways to alternative modes of social organization, a new commons, based on social needs that are currently ignored or marginalized.

2. Theory

Radical grassroots social innovations

Social innovation is broadly understood as innovation in meeting the social needs of, or delivering social benefits to, communities. It often refers to the creation of new services, organizational structures or activities that are better or more effective than those of the traditional public sector, philanthropic or market-reliant approaches (Moulaert *et al.*, 2013). Social innovation occurs at the level of social practice and is concerned with the delivery of benefits through the development of new forms of collaborative action. Key to the evolution of new social relationships and structures related to social innovations is the role of collective action, with community-level interaction being at the epicenter of grassroots social innovation (Daskalaki *et al.*, 2019; Kirwan *et al.*, 2013; Woolthuis *et al.*, 2005). Social innovation is, therefore, directly related to grassroots activism, a link that is well reflected in the term 'grassroots innovation.' The latter has been a key aspect of social and environmental movements, associations, community leadership and bottom-up initiatives to improve living conditions, community life and people's place in society (Moulaert *et al.*, 2013). The growing interest in grassroots innovations, like community currencies (Seyfang and Longhurst, 2013) or community energy (Smith *et al.*, 2016), reflects the increasing dissatisfaction with the directions and outcomes of mainstream innovations in technology, policy and governance systems, including concerns for the uneven distribution of the potential benefits of such innovations across social groups and classes (Jessop *et al.*, 2013). Not surprisingly, grassroots innovations with more critical or contentious aspects have so far only marginally penetrated mainstream discourses of innovations for sustainability.

Here, we are particularly interested in grassroots innovations that explicitly relate to social movements and grassroots activism (Seyfang and Smith, 2007) and concern both socio-natural and socio-spatial relations. The latter includes forms of social organization, community and collective empowerment, collaborative action and democratic decision-making (i.e. initiatives based on direct democracy; see also Jessop *et al.*, 2013). This is central to our approach and aims to prevent the disassociation of innovations from their social benefits and to resist their depoliticization, as often happens in technocratic discourses that disconnect innovations from changes in social relations. We also explore the ways these initiatives incorporate social, environmental and spatial aspects, placing the inseparable relation between social, spatial and environmental justice at the center of both radical political ecology and critical geographical research (Apostolopoulou, 2022; Apostolopoulou and Cortes-Vazquez, 2019). Importantly, we disassociate the concept of innovation from the contested and controversial notion of sustainable development by focusing on the following two distinct characteristics of what we term radical grassroots social innovations: their potential to tackle inequality and to offer a pathway for reinventing the commons.

Our choice to use the term innovation, despite its intellectual and political baggage, is a conscious one. It stems from our intention to challenge its mainstream framing, and emphasize the need for redefining it as the kind of social change that has the potential to challenge current social, economic and environmental realities. It also reflects the need to highlight that this kind of systemic change should be driven by demands for social, spatial and environmental justice and not by capitalist interests. Through radical grassroots innovations that are related to and emerge from social struggles and movements, and that involve a variety of local actors and forms of knowledge in the process of innovation, including lay, community and Indigenous knowledge, we can identify a variety of key issues that are not usually considered by technocratic institutions (Smith *et al.*, 2016). In that sense, these can be seen as emergent processes marked by everyday practices and everyday politics, available resources, diverse forms of knowledge, narratives, local specificities and structural factors of uneven geographical development, indicating a complex process that could also lead to dissolution, co-optation, tensions and uncertainties, exclusion and silent grievances (Gagyí and Vígvári, 2018).

In what follows, by taking the latter into consideration, we try to look at grassroots innovations in a way that captures their dynamic nature.

It is important to point out that we use the term *radical* to indicate that, in line with both radical political ecology and critical geographical research on social-environmental protests and struggles over access to and control of socio-natures, space and place, our focus is with initiatives that support anti-oppression politics by standing against gender, class, age, race and ethnicity inequalities (Roman-Alcalá, 2018), advocate for relations of care, solidarity, egalitarianism and direct democracy (Apostolopoulou and Kotsila, 2021), and make claims for localization, democratic participation, social/environmental/spatial justice-focused governance, and Indigenous leadership (Temper *et al.*, 2020). Even though the degree to which each initiative pursues these political characteristics varies significantly, acknowledging their importance and including them in their demands is key both to the characterization of radical grassroots innovations, and their explicit differentiation from oppressive, right wing or populist initiatives.

The three Rs perspective and the spatialities of grassroots activism

Katz's (2004) analytical breakdown of community responses to capitalist development into *resilience*, *reworking* and *resistance* allows us to understand the multiple levels and different forms through which everyday community and activist practices are built and, thus, the domains wherein innovations may emerge and evolve. *Resilience* evokes a need to develop ways of coping with adversity, shocks and crises, along with a desire to protect, sustain and nurture communities, their people and their infrastructures (Katz, 2004). *Reworking* tends to be driven by explicit recognition of problematic conditions and offers focused, often pragmatic, responses to them (*ibid*). *Resistance* invokes a more oppositional and critical consciousness to confront historically and geographically specific conditions of oppression and exploitation at various scales (*ibid*). Acts of resistance are rarer than the other forms of activist practices, given the required consciousness-building involved and their explicitly oppositional character. Looking at these three together, we see a complex set of interrelated practices and processes at work as communities simultaneously try to create resilient support mechanisms, rework themselves as political actors equipped to build a better and fairer world while materially resisting inequalities to improve everyday lives.

The 3Rs are not in practice distinct, but they are rather interconnected; "boundaries are blurred and passages between them can be almost imperceptible" (Katz, 2004, p. 152). In the analysis that follows, we use this nuanced understanding of resistance to explore how grassroots innovations related to various forms of community activism and social organization, in different contexts, offer differing pathways to tackle socio-spatial inequality and reinvent the commons, thus also presenting different imaginaries and futures. Furthermore, considering that Katz's approach was originally developed to compare rural Sudan and urban New York, it is particularly relevant to our purpose, namely to compare the ways communities respond to social, spatial and environmental injustices across diverse places within and beyond cities.

By considering space and place as key in the emergence and evolution of social struggles, movements and grassroots social innovations, we add to these three concepts an explicitly spatial aspect by paying attention to the *spatialities of grassroots activism* and the way these are implicated in contentious politics (Featherstone, 2015; Jacobsson, 2015; Leitner *et al.*, 2008; Mayer *et al.*, 2016; Nicholls *et al.*, 2016; Pile and Keith, 1997). Our aim is to highlight through this approach that resistance occurs through specific geographies (e.g. on the streets) and around specific geographical entities (e.g. the nation or the region) creating specific geographies of resistance (Pile and Keith, 1997). Resistance is expressed spatially in the sense that it occurs in geographies that make it possible for certain forms of resistance to emerge while making other forms impossible (Prause and Le Billon, 2021). To unravel the ways in which grassroots groups use space and organize across it and how grassroots practices are shaped by spatial formations and the particularities of space (Chatterton and Pickerill, 2010), we explore the emergence of grassroots and political activism in particular places as reflections of the uneven geographies of contemporary capitalism (Featherstone, 2008, 2015). We also consider how they can exceed the local, and acquire a broader meaning in the struggle for social change (Harvey, 2005; Featherstone, 2008). This requires an analytical and empirical spatial sensitivity

to how places can become spatial metaphors for understanding the situated practices that shape and determine their formation (Hudson, 2001). Struggles emerge in particular places and not in others. To achieve this, we explore the interrelationship between a commitment to build networks of solidarity and trust in place-based, local community struggles and the aspirations of extra-local activism and a broader re-imagining of political, economic and cultural processes. We do this by paying attention to how innovations operate by crossing scales.

3. Case studies and methods

Our analysis is based on primary empirical research in a variety of geographical, political and cultural settings across the Global South and North conducted by the authors, covering various time periods over the last decade. Our empirical material includes 12 cases from nine countries (Table 1) where grassroots innovations are a key aspect of community activism and social struggles and movements.

We used qualitative social science research methodologies and followed a grounded theory approach in order to infer a theoretical elaboration of the different practices of radical social grassroots innovations. We also performed a classical content analysis of more than 150 interviews, to identify key problems and inequalities, key innovations (including commoning initiatives), proposals for alternative social organization, and spatial practices of resistance across our case studies (Table 2). A more detailed description of each case study is provided in Appendix 1.

	Case study	Methods	Year(s) of fieldwork	Field areas	Types of interviewees
1.	Elder citizens organizing for restoring and maintaining local water environments	Semi-structured interviews, direct observation	2016	River Adur catchment, West Sussex, United Kingdom	Naturalists, residents, parish and county councillors, community group volunteers, artists, business owners, farmers
2.	Community resistance to mining developments	Participatory research, interviews	2017-2018	Cajamarca, Colombia	Community members, youth, peasants, environmental organizations
3.	Indigenous organizing for commons-based irrigation systems	Participatory research, interviews, collective multimedia documentary	2010-2011, 2018-2019	San Isidro, Cotopaxi Province, Ecuador	Residents, representatives, families, workers in and around the community
4.	Community struggles against oil extraction	Semi-structured interviews, direct observations, focus groups	2015	Izhma region, the Republic of Komı, Russian Federation	Community leaders, community members
5.	Autonomous and self-organized community outdoor domestic space at	Direct observation, participatory photography, spatial and	2008-2011	Aldeia Itamarã and Ocupação Bubas, Brazil	Municipal actors, community leaders, urban dwellers, peasants

	Indigenous villages and urban occupation	visual analysis, semi-structured interviews, focus groups			
6.	Community gardening	Ethnographic research, interviews, archival research	2018-2020	Hellenikon, Athens, Greece	Community gardeners, policy makers, members of the anti-privatization struggle, companies
7.	Rural community opposition to the Keystone XL pipeline project	Participatory and ethnographic research, photo documentation, interviews, focus groups	2010-2014	Rural Nebraska, United States	Bold Nebraska members, landowners, ranchers/farmers
8.	Collective water governance innovations on peri-urban land	In-depth interviews, community walks	2015-2016	Faisal District, Cairo, Egypt	Residents, urban activists, policymakers
9.	Civil society organizations' campaigning for community land rights against extractive development	Semi-structured interviews, review of media, policy and campaigning materials	2014-2015	Cabo Delgado province, Maputo, Mozambique	Civil society activists involved in a platform organization for transparency in the extractives sector
10.	Low impact living developments	Ethnographic research	2016	England (specific places are not mentioned to ensure anonymity)	Activists, community members
11.	Anti-privatization struggle; collective water governance and commoning innovations	Ethnographic research, interviews, archival research	2020	Stagiates, Volos, Greece	Activists, community members
12.	Community groups against the installation of wind farms	Ethnographic research, interviews, archival research	2020-2022	Agrafa, Crete, Kythira, Aegean islands, Greece	Activists, community members, local administration

Table 1: Case studies and research methods.

We selected these cases because, despite significant differences, they all have three important elements in common. Firstly, they show how collective action can generate mobilization and hope, by helping people form solidarity networks that are essential to questioning hegemonic policies and injustices that would otherwise remain unchallenged. Secondly, they show that a more equitable distribution of social power and

more egalitarian and just social, spatial and environmental relations are possible. Thirdly, they offer suggestions as to how this can be achieved by offering concrete examples of grassroots radical social innovations. These include social innovations as diverse as low impact living, community gardening, community-operated irrigation systems and grassroots initiatives and innovations with respect to alternative, bottom-up forms of social organization and commoning.

We should point out that in what follows we broadly define social movements as processes of collective action that stem from grievances around perceived injustices, pursuing alternative agendas across space and time (Bebbington *et al.*, 2008; Villamayor-Tomas and García-López, 2018). We also include practices that have been traditionally characterized as a "quiet encroachment by the poor", as everyday acts of survival of marginalized communities under autocratic conditions (Bayat, 2013). Finally, we draw on the work of scholars that have explored how the everyday "sidelining" of the state in many cases transforms into different forms of direct confrontation, including confrontational acts of resistance (Abdelrahman, 2015).

Case study	Key problems/ inequalities	Key innovations & commoning initiatives	Social organization & the spatialities of resistance
1. Elder activism, England	Disregard of the local/national state towards water-related issues and municipal withdrawal from public services	Reworking elder contributions to communities and activism, joining Parish Councils, forming Flood Action Groups, campaigning within Residents Associations, small scale mitigation/restoration work, raising awareness of retracted (local/national state) services, social media to maintain pressure on influential stakeholders	Working across competing interest groups and at local and regional levels. Some actions are site - and even issue - specific but others map onto broader considerations of global environmental concerns
2. Anti-mining movement, Colombia	Planned mining developments in territories without popular consultation	Promoting non-extractive livelihoods rooted in an agrarian identity, including agroecological practices, supportive women's network, The Network of Community Aqueducts of Cajamarca, organizing the "Marcha Carnaval en Defensa de la Vida" in the regional capital	Cooperative organizing model involving youth, peasant and environmental organizations sharing platforms, making decisions collectively and working together on local extra-village projects and mobilizations
3. Community-operated irrigation, Ecuador	Inequality in access to land and water, experienced in particular by Indigenous communities	Community-operated irrigation pipeline (requiring renewed commitment to collective decision-making processes and cooperative work); and reviving shared use of communally-owned areas of <i>páramo</i> moorland (where the pipeline sources its water), revival of <i>mingas</i> – regular days of coordinated, voluntary work within the community	Cooperation within and between local communities; <i>asamblea</i> , a political decision-making structure (based around the leadership of an elected council and universal participation in community meetings); cooperation within the local union of Indigenous communities and with the provincial branch of the national Indigenous movement

4. Anti-crude oil struggle, Russia	Indigenous peoples' struggle against extractivism and subsequent environmental pollution/injustice	Re-establishment as a traditional agriculture, herding and collecting economy among Indigenous people; use of traditional livelihoods in modern ways	Locally established women's advocacy groups and a woman leader, supporting the struggle for recognition as Indigenous peoples and aligning with global climate action that achieved international support
5. Edible landscaping in urban areas/squats, Brazil	Degradation of livelihoods, social inequality and environmental injustice, environmental racism, unemployment and inadequate salaries	Self-organized practice of edible and medicinal landscaping of outdoor domestic spaces; reorganized production strategies for securing their livelihoods, sociability, knowledge exchange, environmental upgrading, security of tenure and food sovereignty	Local organization between households, managed mostly by women in rural Indigenous villages and urban informal settlements
6. Community gardening, Greece	Privatization of land and public space, prolonged austerity, increasing urban poverty and marginality	Creation of a community garden with collaborative, bottom-up decision-making, no private property rights and cultivation based on organic agriculture and following the principles of sharing	Decision making through open monthly meetings in a democratic, equitable, and anti-hierarchical manner. Local and strongly attached to place but attracted both national and international solidarity
7. Mobilizations against oil pipelines, USA	Widespread encroachment of an energy project into local communities	An unlikely alliance of farmers, ranchers, Native Americans, environmental activists, and concerned citizens creatively utilized local culture and mobilized funds at the grassroots level, holding informational and educational sessions	Local and diverse opposition movement aided by state-wide campaigners (Bold Nebraska) who tackle broader issues
8. Mitigating water shortages, Egypt	Inequality in public infrastructure systems for water provision	Community organizing to build and maintain collective water pumps and piping	Traditional forms of local community organizing, electing a community leader to direct and oversee processes
9. Community land rights from gas production, Mozambique	Distributive and procedural injustice around the relocation of communities to build a gas processing plant	Training community paralegals and establishing community committees to invoke state laws that protect communities	Civil society organizing at the local level
10. Low impact living, England	Environmental and social inequalities of capitalist society, including the housing crisis and	Using permaculture and low impact development notions to build self-reliant communities, collectively generating their own energy, growing and collecting their own food and	Direct democracy decision-making at the local level, very strongly attached to place

	environmental degradation	materials, creating water systems and disposing of their waste.	
11. Anti-privatization struggle and commoning innovations, Greece	Privatization of water, dispossession of the commons, authoritarian governance (policing practices)	Bottom-up collaborative and inclusive decision making (open democracy), several cultural initiatives organized by the people (libraries, movies, concerts), community-operated water supply	Strongly attached to place, culture and memory; water as cultural heritage of the community and as the essence of the commons; solidarity between different villages and with nearby cities
12. Community action against wind farms, Greece	Environmental impacts (installation of wind farms even within protected areas) and wider implications for the landscape and local communities' history and identity; land grabbing; green grabbing	Collaborative decision-making; community-based climate adaptation plans; described and experimented with alternative pathways towards energy and climate justice	Strongly attached to place, nature and culture; solidarity between different struggles and with various civil society organizations. Some actions are site-specific but others map onto broader considerations of national, regional and global environmental concerns around energy transitions and climate justice

Table 2: Key elements of the case studies.

4. Radical grassroots social innovations: Opening pathways for tackling inequality and reinventing the commons

Grassroots social innovations as a response to rising social, spatial and environmental inequality

In this section, we describe the key issues that are addressed by the different struggles, and the key innovations they form as responses to perceived inequalities. We show how seemingly separate issues are interrelated and how in all cases the responses to them include both alternative and innovative forms of social organization, such as establishing local assemblies or groups or instituting diverse decision-making processes, as well as alternative practices to support livelihoods and essential local services, such as creating community-based irrigation or water systems. A key insight from the analysis of our cases is that rising inequality has triggered a variety of grassroots responses from affected local communities that reflect the capacity of social conflict to produce transformation (Temper *et al.*, 2018). In all the cases explored here, local groups, communities or entire villages realized that the way to confront unequal governmental policies was to form collective responses and strive for social solidarity (see also Featherstone, 2015). In particular, we identified three broad forms of inequality in our cases that are linked to various interrelated crises of capitalism. Several of the issues explored in what follows are nonetheless often overlapping and diffused, and most cases may fall into several categories.

The first category involves the lack of quality public services, unfair access to land and natural resources (i.e. water) and public disinvestments that stem from the widespread state disregard towards local needs, social reproduction and the commons. This has disproportionately affected people along lines of class, ethnicity, and gender and has been expressed in a geographically uneven way.

In West Sussex, England, what triggered elder-led environmental activism was a combination of site-specific events, including flooding and the termination of local municipal services for drainage and river management, along with the realization that the state, in the form of local and central government, is no longer capable, or willing, to protect local residents and their environments from extreme events. In this context, elders stepped up to fill in the gaps left by the state to achieve solutions for their community's problems. In San Isidro, Ecuador, social movements have been mobilized both to resist land and water inequalities boosted by historical water concessions and to demand fairer access to resources, but also to address the challenges that agriculture faces due to the dwindling land base and the semi-arid climate. The community-operated irrigation project has reworked social-ecological relations by bringing back historical methods of community organization to source water from communally-owned areas of *páramo* upland moors. Similarly, the residents of Faisal, Egypt, were prompted to mobilize responses to severe water shortages in their district, caused by the state's disregard for the community's need for water infrastructure and services, and the prioritization of projects that aimed to service the suburban elite. After years of trying to gain the government's attention to solve their water issues, residents took control of water access conditions and organized the management of their own water systems, electing a community leader to collect funds and oversee the installation and maintenance of groundwater pumps. In these cases, affected communities have mobilized to keep their governments accountable for the poor provision of services, but also they did not wait for them to act and instead attempted –and often succeeded– in establishing alternative forms of social organization and innovative practices, either to fulfil community needs or to replace the services formerly or defectively run by dismantled states (Routledge *et al.*, 2018).

The second form of inequality refers to the social-environmental impacts caused by the encroachment and settlement of capitalist forces in specific areas, primarily in the form of extractive, agribusiness, renewable energy and real estate industries, without the consent and approval of local communities but authorized by the state (see also Horowitz, 2012). The grabbing of land and resources has given rise to significant opposition movements across the Global South and North, constituting major sources of environmental conflicts that have led even to the assassination of activists (Dressler, 2021; Le Billon and Lujala, 2020; Prause and Le Billon, 2021; Tran *et al.*, 2020). In Colombia, the small municipality of Piedras organized a popular consultation to give local people a say on whether a South African-based multinational, AngloGold Ashanti S.A., could build the mine tailings dam for the La Colosa mine in their territory. They created community platforms, regional networks, popular education and non-violent direct actions while actively seeking international solidarity. Several other initiatives are currently underway seeking to strengthen traditional livelihoods and pioneer new economic activities while respecting the rights of local people and the ecosystems they rely upon through, *inter alia*, agroecology, gender equality and relations of care, the cooperative management of natural resources, community water sharing, storytelling and art.

On the other hand, the residents of the Afungi peninsula in Mozambique were due to be relocated from their homes and displaced from their agricultural lands to make space for construction of US oil and gas company Anandarko's gas processing plant. While the Mozambican state was intent in pursuing the extractive project with Anandarko, local communities were concerned about the way the company acquired their lands and the way the plant would impact them without providing any benefits. These led them to self-organize and establish community committees and train community paralegals to oppose and negotiate with Anandarko. In the Izhma region in Russia, communities have been resisting crude oil extraction by the private company Lukoil. Apart from community protests, extensive negotiations and close community "watch" over the legal and procedural aspects of the projects' implementation, they took specific initiatives to (re)establish traditional livelihoods based on agriculture and reindeer herding, founded on local knowledge, sharing and the regeneration of nature, to defend their lands and livelihoods from dispossession and exploitation (see also Temper, 2019). Finally, local communities across Greece have been contesting the acquisition of vast areas of land for the construction of wind turbines, the authorization of industrial-scale renewable energy projects within protected areas and their irreversible impacts on sociocultures, landscapes and local communities. Again, apart from protests, many local communities have managed to build broader solidarity networks and strengthen collective action with the goal to not only resist the unequal impacts of controversial energy projects but also to formulate effective alternative strategies, placing the right to energy and climate justice at

the core of their demands. Frontline communities have also managed to formulate community-based climate adaptation plans and directly challenge the discourse of green capitalism by developing their own strategies and actions as part of a wider plan that would ensure social-ecological sustainability and justice.

The third category refers to the combined effects of the interrelated crises of capitalism and neoliberalism, such as the housing, climate, and food crises, the uneven impacts of postcolonialism and imperialism as well as systemic racism (Featherstone, 2015). An indicative case here is the Indigenous Guaraní village Aldeia Itamarã and the urban occupation Ocupação Bubas in Brazil that provided housing to people evicted from their lands due to the establishment of a hydroelectric power plant, agro-industrial and extractivist expansion and real-estate pressure. Faced with historical marginalization that has led to the degradation of their livelihoods, social and environmental injustices, racism, unemployment and inadequate salaries, the residents of these communities have organized to cultivate food communally in the outdoor space. This Outdoor Domestic Space contributes to household food sovereignty, securing livelihoods, healthier environments and alternative social relations within communities, enabling spatial resilience (Verissimo, 2012). In England, the low impact development communities of Diggerville and Woodville emerged as alternatives in opposition to the social and environmental injustices caused by increasing housing precarity, urban marginality and nature-society alienation in a context of prolonged austerity politics. In looking to establish more environmentally sound and democratic ways of living, the founding members of these communities adopted novel alternatives to mainstream housing, energy, water and food systems through decision-making processes based on direct democracy, a communal ownership of land as well as climate and environmentally friendly ways of producing food and energy.

Moreover, in Hellenikon, Athens, citizens organized themselves to take control of the area of the former international airport of Athens, creating a new commons. They acted in opposition to the ongoing privatization, enclosure and outsourcing of public land and urban space, prolonged austerity and public disinvestment, increasing urban poverty and the chronic absence of safe, open, public green space in the city. For six years, the citizens communally maintained a guerrilla garden following a model of direct democracy, distributing the food they grew according to social needs and fostering an anti-hierarchical project based on social solidarity that directly opposed notions of privatization and individualism. Finally, the small village of Stagiates in Volos, Greece, offers an emblematic example of an alternative social organization, with the entire village deciding to form popular assemblies (*λαϊκές συνελεύσεις*) when they realized that their elected representatives were not willing to address their needs and prevent the privatization of the village's water resources. Even though this was triggered by a specific event related to their need for communal (not just public) ownership and free access to natural resources and public services for all, their response also resulted from the realization that the issues they were facing, including water privatization, dispossession of the commons, attack on their cultural activities, and prolonged austerity in the broader region, were interrelated and were part of the same battle against the deterioration of their everyday lives. Even though community responses in these cases are sometimes triggered by specific events of inequality, in most cases they involve movements that emerge in opposition to various, interrelated and ongoing crises, and that strive to develop alternative practices to current modes of socio-economic organization (see also Temper *et al.*, 2018).

Radical grassroots innovations and the 3Rs: Rethinking the links between transformative change and the politics of everyday life

As our case studies show, community interventions and grassroots innovations are evolving processes that may take different forms and that involve varying degrees of consciousness and willingness to confront capitalism. Katz notes (2004, p. 251) that instances of resilience and reworking are "easier to identify" than instances of resistance. Indeed, in almost all cases we observed instances where community interventions offered examples of reworking by altering the conditions of people's existence "to enable more workable lives and create more viable terrains of practice" (*ibid*, p. 247) and occasions where grassroots innovations helped communities build resilience. Characteristic examples are the cases of Brazil, Egypt and Stagiates in Greece, where community interventions created socio-spatial grassroots innovations, such as Outdoor Domestic Spaces and community/communal water systems, as a response to socio-spatial inequalities in the provision

of water, green spaces, comfort, income and food. The Egyptian and the Greek cases demonstrate quite clearly how building networks of resilience and reworking them is part of the everyday, grounded practices of local communities. When faced with a lack of water supply or the prospect of privatizing water, community responses centered on collaborative processes, reworking official water infrastructures and installing community-owned systems to guarantee (urban and rural) water security.

In Egypt, spontaneous community leaders organized building committees to raise funds, hire local labor, and to manage sustainable access to new wells and community sharing. These networks of resilience built on community self-help systems that preceded governmental interventions, as well as on the expertise of local plumbers and engineers to rework the malleable built environment. The West Sussex case in England also exemplifies intransigent land ownership practices whereby the land management regime of an aristocratic estate, owned by a peer of the realm, is cited as impacting negatively on "downstream" community residents through chronic flooding events (Gearey and Ravenscroft, 2019). In response, a community association of elders collaborated to hold the estate landowner to account through various tactics, including direct confrontation; raising funds to pay for environmental impact reports to counter planning and development applications; and influencing public discourse through social media activism. In all three cases, community organizing filled in the gap in governance left behind by neoliberal policies. Similarly, in Ecuador, more equitable and locally-controlled access to water has been created in part by reworking inherited forms of decision-making and cooperative labor enabling community-based agricultural projects to expand, further contributing to a more resilient economic base.

Importantly, the attempt to find practical solutions within a context of limited state resources for environmental protection and social reproduction can lead to practices of resistance, even if direct confrontation or a more radical critique was not initially the community's purpose. For example, in the English case mentioned above, practices of resilience, without which some services would cease to exist, led to the emergence of a clearer form of resistance because grassroots groups, through their engagement with everyday politics, gained consciousness of the need to accelerate radical grassroots innovations and act upon them. Resistance expands to practices of reworking, but there are complex dialectics between reworking, resilience and resistance. The anti-mining struggle in Cajamarca, Colombia, also offers a paradigmatic example of the latter. Communities used legal mechanisms and several innovative activities to strengthen traditional livelihoods and economic activities. In this process, acts of resilience, such as the creation of the Peasant Women's Alliance of Cajamarca that created a space of collective sharing and healing for women affected by mining, coexist with acts of resistance where the youth are forming cooperatives to mobilize and directly oppose mining activities. Moreover, San Isidro, in Ecuador, joined a growing number of communities across the region who are reworking *mingas* (days of shared labor) and applying that work to contemporary challenges in innovative ways, building new networks of cooperation in the process. A similar case occurred when the Komi people of the Izhma region in Russia tried to rework their relationship with the state and the encroaching Lukoil-Komi extractive company through advocating for reindeer herding and cattle breeding, to secure their livelihoods against an industrial future. As soon as it was made clear that both the government and the company were not willing to incorporate community needs and safety in their development plans, community innovative activities transformed to open resistance, embracing their identity as Indigenous peoples and demanding their rights to be recognized and linking their struggle with broader global social-environmental movements.

Building on the above point, several of these cases show the inseparability of transformative and transitional demands and struggles. In line with Katz's framework, which does not prioritize between resistance, reworking and resilience practices, our empirical material highlights the political significance of seemingly simple grassroots innovations, like community water infrastructure projects (Egypt, Ecuador, Greece), and edible (Brazil) and guerrilla (Greece) gardens. These practices, while not transformative *per se* (Temper *et al.*, 2018), have salient material implications for local communities, ranging from access to potable water and urban space to flourishing human and more-than-human relations of solidarity and care. This does not negate the importance of an analytical and political distinction between transformative and transitional movements, and a radical critique of reformist approaches to social change (Pellenc *et al.*, 2019).

Rather than countering the distinction between transition and transformation, what we aim to point out here is that designing and implementing radical grassroots innovations with a transformative potential is often inseparable from the politics of everyday life and grounded practices of reworking and resilience. Making radical transformations can involve innovations in transforming power structures and social relations, as with the Hellenikon community garden or the Stagiates bottom-up social organization in Greece. But, also, there are subtler, often unnoticed, practices and reconfigurations of everyday life, as in the case of edible gardens in Brazil. Our empirical material and mode of analysis (Katz, 2004) stress that different kinds of practices are interwoven and it is the wider socio-economic and political context along with the characteristics of each struggle that can shift these practices towards a different direction, leading to the radicalization of everyday politics (see also Apostolopoulou and Cortes-Vazquez, 2019; Apostolopoulou, 2020b). We, therefore, agree with but slightly diverge from Pellenc *et al.* (2019) and Temper *et al.* (2018), who stress "continuity" between what they call resistance and alternative movements.

A key indication of the complex dialectics between the 3Rs is the way that, in several cases, decision-making processes based on direct democracy opened a pathway to a radical reformulation of local politics towards anti-oppression, including anti-capitalist, anti-sexist and anti-racist politics. In the Russian and Brazilian cases, grassroots movements have been led by women. The movement in Colombia also gave way to a women's alliance whereas in both the cases of the Hellenikon and Stagiates in Greece, women had leading roles. Other movements also transformed power relations by either challenging the relegation of older citizens in their communities or (re)centering the urban poor, refugees and unemployed people in their decision-making processes. Similar insights were gained in the Stagiates struggle, where the community's collective organization in public assemblies created an inclusive community open to immigrants, refugees and LGBTQI people. The cases of San Isidro, Izhma and Nebraska also refer to movements focused on the rights of Indigenous people and their struggle against power structures that do not respect their needs and social rights.

None of this implies that any grassroots innovation that primarily constitutes an act of resilience or reworking will inevitably transform into an act of resistance. Nonetheless, in the current context of a politically restricted environment due to the ongoing and combined crises of capitalism, the act of challenging power inequalities, no matter how outwardly or subtle, may point to a future where power inequalities can be contested, and in that sense, be transformational (see also Auyero *et al.*, 2017; Vu, 2017). And of course, to less powerful or vulnerable groups, victory may not only lie in the complete transformation of power inequalities. Smaller victories that contest hegemonic powers may also be crucial (Antonsich, 2013). Our case studies also show that grassroots innovations have concrete, practical implications for people, pointing to the need to acknowledge the importance of addressing material needs that can improve peoples' everyday lives even if a more profound, radical transformation has not (yet) occurred. Such is the case of the Afungi peninsula in Mozambique, where residents claimed as victories delaying their relocation and securing some concessions. On the other hand, the fact that the residents were ultimately due to be relocated shows the limits of non-transformational action in the sense of the fragility of any concessions and victories. Overall, while in some cases victories may be sustained, ameliorating people's lives and partly addressing inequalities (DeVerteuil and Golubchikov, 2016), in others, the absence of a more long-term prospect may lead to defeats. In that sense, grassroots innovations, no matter how important they may be for everyday lives, may fail to sustain themselves if not linked to practices of resistance. However, there are also cases where the three Rs may work against each other in the sense that resistance may lead to less resilience or make reworking harder, as for example when authoritarian regimes take out resistance leaders and murder or arrest them.

A final note is important here regarding the role of the state. Most case studies reveal the Janus-faced role of local and national governments and their attempt to co-opt the radical and innovative elements in grassroots activism. From direct subsidies (Russia) and official state water infrastructure (Egypt) to irrigation grants to Indigenous communities (Colombia) and implicit involvement through the national legal system (Mozambique), local and national states have sometimes been, at least in part, positive in the development of the innovative practices described here. At the same time, states have traditionally stood against radical social and environmental innovations and our case studies (i.e. England, Egypt, Hellenikon, Stagiates) underscore that element too. Finally, we must consider the peculiar cases of Russia and Mozambique, where in one instance the governments have supported hydrocarbon extraction while on the other they have provided

subsidies for alternative livelihoods (Russia) or a legal framework that challenges part of the extraction agenda (Mozambique). The latter confirms that when viewed from the standpoint of their autonomy (Escobar, 2018; Pickerill, 2007), grassroots innovations have a rather complex relationship to both national and local governments (Zaimakis, 2018; Routledge *et al.*, 2018).

The spatialities of resistance: Place-based activism and the rescaling of praxis

All the cases explored here refer to grassroots innovations that have emerged in the context of place-based struggles and movements, and whose distinct characteristics cannot be properly understood without understanding their attachment to place and to people's desire to co-produce the geographies of their everyday lives. In all cases, we see that places shape peoples' political subjectivities, providing them, as Nicholls *et al.* (2016, p. 4) argue, with "frameworks for interpreting whether injustices have been done and whether collective and contentious responses are merited." It is within locales that people form "epistemic communities" to interpret "whether the abuse they face amounts to a violation of the 'social contract' and merits a forceful and collective response" (*ibid*). This also means that, since space is produced by dominant powers, alternative uses and understandings of that same space that differ from hegemonic definitions and uses can indicate radical practices (Antonsich, 2013; Massey, 1994). Indeed, all the grassroots innovations explored here manifest collective efforts to improve everyday lives *in particular places* by opposing and fighting back the imposition of unequal policies and find alternative, innovative ways to sustain social reproduction in the face of the entrenchment of neoliberal policies and the collapse of the welfare state experienced in all countries in different degrees. These grassroots innovations denote different tactics and political imaginaries, showing how the further neoliberalization of nature and space can be resisted, and how the future might be organized. What clearly connects them is that they all indicate a desire to regain control over local space in a period where access to public space has become subject to privatization, enclosure and surveillance (Apostolopoulou, 2021a, b; Apostolopoulou and Liodaki, 2021; Apostolopoulou and Kotsila, 2021; Boyer, 2015; Leitner *et al.* 2007; Mihaylov and Perkins, 2015).

As Massey *et al.* (2009) argue, to make a politics of place possible is about explicitly asking, "what does this place stand for?" But if spatiality is conceived in terms of space-time and as formed through social relations and interactions at all scales, then places should be seen as nodal points of connection in wider networks of socially produced space and local articulations "within a wider whole" (Massey, 1994, p. 4). Places are, thus, formed through relations with wider arenas and other places and their specificity arises from the particularity of interrelations with what lies beyond them, that come into conjuncture in specific ways (Hart, 2006). This means that asking what a place stands for, a question that lies at the core of all our case studies, also leads to a broader question, namely how each particular place is implicated in wider processes that local struggles may (or may not) wish to contest (*ibid*).

We argue that this "extroverted sense of place" (Massey, 1994; see also Lefebvre, 1991; Hart, 2006) is key in exploring grassroots radical innovations and their relationship to space and scale. This is well explained by Massey *et al.* (2009) when they argue that

...the global does not exist up there. It is made in places and there is hardly a place on the planet that in some ways isn't party to that making. That is what transition towns are about; trying to think about one's locally-based responsibility. That is what fairtrade regions are about, and different places are in one way or another trying to address that.

This is reflected in almost all our case studies. For example, efforts to sustain livelihoods through edible landscaping in Brazil may seem localized, but are actually part of broader national efforts to cover social needs that cannot be met by the government in a collective manner. Struggles for water in Faisal (Egypt), San Isidro (Ecuador), and Stagiates (Greece) are clearly place-based but also openly related to active resistance against the broader privatization of natural resources and public space, and various processes of accumulation by dispossession (Harvey, 2010). Innovations in social organization may be grounded in specific places but reflect a wider critique of hierarchical governance structures and undemocratic decision-

making processes that go beyond the local, reflecting communities' collective imagination about their future. The establishment of anti-hierarchical community structures or decision-making processes based on open democracy and solidarity are emblematic manifestations of such collective visions that directly oppose the neoliberal visions of privatized or gentrified green enclaves for the elites governed by technocrats and public-private consortia. They signal, therefore, a criticism of governmental policies that transcends any particular place, as evidenced in the solidarity that several community initiatives have received both nationally and internationally.

The above also highlights the need to cross scales in order to create enduring innovations capable of gaining wider support and solidarity, organically connecting with similar movements to form broader agendas and networks of resistance, increasing their chance to obtain long-term victories. We define this rescaling of praxis as the intentional effort towards building new network connections, and we consider it critical for building local-global alliances, seeking extra-local solidarity and mobilizing financial resources and human capital. Nonetheless, and as shown quite clearly in the case of the Keystone XL Pipeline in Nebraska, it can often be challenging to achieve this rescaling without compromising the strategic political goals of any specific movement. It is thus important to differentiate between "upscaling", that carries the risk of replicating bureaucratic structures and compromising democratic processes specific to particular socio-cultural contexts, and "rescaling" which refers to deliberate strategies for extending the reach of transformative initiatives without uncritically accepting compromises that may lead to the dissolution of the movement. The latter denotes an approach to "outscaling" and knowledge exchange, where core processes and principles are shared between organizations and communities but applied differently within place-specific struggles (Temper *et al.*, 2018). For example, the Komi people in Russia may have locally-specific demands, but without gaining the support of broader national and international movements and campaigns against fossil fuels and in support of Indigenous rights, they may not have been able to effectively pressure the extractive company into making concessions. In other contexts, a critical goal can also be to rework or to continually renegotiate roles within broader networks of cooperation that already operate on a national or outscaled degree. This is seen in Ecuador, for example, where communities that collaborate with the national Indigenous movement are subject to power imbalances (due to the organization's hierarchical structure) but at the same time strengthen the reach and relevance of the national network through localized activities that draw on place-based expertise and experiences.

It is important to point out here that different scales are not only spatial but also temporal. Several contemporary grassroots innovations build upon unique histories of organization and collective practice, with Ecuador and Stagiates in Greece being indicative examples of the latter. Communities can significantly benefit from successfully drawing on decades of prior experience by using forms of organizing and cooperating that have been developed or practiced over decades. Furthermore, processes of transformation are dynamic, contingent and non-linear in their ripple effects and influences, which means that capturing and assessing the outcomes or the success of such initiatives is beset by methodological and epistemological challenges (Temper *et al.*, 2018). Outcomes are thus not always time-bound and may take time to become apparent. The English West Sussex case highlights this well: the auxiliary collaborative work undertaken to support fish spawning grounds may prove fruitful only long after the elder initiators of the work have passed away. Similarly, the strengthening of organizing infrastructure by providing the means that can support the continuation of community actions into the future shows how radical social innovations have the potential to generate further successes, but this only becomes visible once new projects and mobilizations are undertaken (Vu, 2017). This is obvious, for example, in the Egyptian case, where younger generations of community leaders are now emerging and continuing their predecessors' hydraulic self-help systems.

Grassroots innovations and the reinvention of the commons

Perhaps the most emblematic indication of the importance of attachment to place in all cases is the effort of communities of struggle to oppose the dispossession of the commons, that in many cases also encompasses attempts to create a *new commons* (Hamann and Türkmen, 2020). Democratic control over land and resources within particular spaces, as well as resistance to capitalist modes of production, distribution and

circulation imposed from above constitute key characteristics of commons regimes (De Angelis and Harvie, 2014). The latter have been found to often supersede the effectiveness of resource management practices that are privatized, market-oriented, or minimally state-based (Agrawal, 2002; Ostrom, 1990) and, therefore, it is not surprising that the place-based struggles explored here focus on the need to protect the commons through localized commitments to solidarity, cooperation, self-governance, egalitarianism and democracy (Akbulut, 2017). Indeed, it is through such commitments that certain commons become sites of grassroots radical innovations by either design or necessity, and others don't. The concept of the commons takes on heightened importance in the context of radical grassroots social innovations. As Chatterton (2010, p. 626) points out, the common is "made real through the practice of commoning." This reflects dynamic spatial practices that carry the potential to form alternative politics, when common goods (i.e. land, soil, water, seeds, air, food, biodiversity, cultural and social practices) that support social and physical well-being are faced with enclosure due to the destruction, privatization, and economic exploitation of rural and urban environments. Cases in Greece, England and Egypt provide indicative examples where the commons and commoning became political bywords for resistance (Chatterton, 2010) within a context of prolonged crisis, austerity and revanchist neoliberal policies in the post-2008 era (Apostolopoulou and Cortes-Vazquez, 2019; Harvey, 2012; Peck, 2012). Similarly, opposition to neoextractivism has been directly related to resistance to the enclosure of the commons (Svampa, 2015), as evidenced in the cases of Ecuador, Mozambique, Russia and Colombia.

Moreover, and importantly, several case studies provide valuable insights on what the new commons may look like, *inter alia*, showing that processes of resilience, reworking and resistance do not necessarily have to produce completely new practices or forms of organization. In particular, in Egypt, Ecuador and Russia, communities used or repurposed already existing forms of socio-spatial organization to resist, rework and build resilience against social, spatial and environmental injustices. In Egypt, residents in Faisal are hybridizing older forms of community and infrastructural organization with modern metering regimes, reworking water access for their communities. In the case of San Isidro, reworking their approach to attain an irrigation system meant bringing back historical and traditional means of social organization, such as the *asambleas* and *mingas*, that do not serve a neoliberal and individualistic society. In the Izhma region, people reclaimed traditional uses of nature to solidify their identity and livelihoods in resistance to oil drilling in their area.

This leads to the important observation that grassroots social innovation does not always mean defining and prefiguring completely novel ways of socio-spatial organization and commoning. In contrast to a significant part of the grassroots innovation literature (e.g. Smith and Stirling, 2016; Smith *et al.*, 2016; Hossain, 2018), we argue that existing, but neglected, practices of communal organization can be important both in adapting to and transforming towards different futures. The example of Colombia is emblematic here. In particular, the statement of the youth environmental organizing group who declared that Cajamarca can create an alternative future that would, *inter alia*, incorporate the circular economy by drawing on its roots and tradition of non-extractive livelihoods.

Finally, the collaborative management of different kinds of commons can propose a rights-based approach to resilience that would move beyond the focus of mainstream institutions, governments and industries on developing apolitical "adaptive" capacities. A rights-based approach demands more: the protection of and state support for localized forms of governance, to ensure equal access to those resources that are necessary for building resilience (Walsh-Dilley *et al.*, 2016). At the same time, our empirical material shows the importance of resilience in strengthening cultural power locally through different combinations of the revitalization of inherited environmental knowledge, the reassertion of local territorial management, the reconstruction of community histories, and the collective redefinition of shared futures (Temper *et al.*, 2018).

Through such practices, already existing forms of organization can be repurposed not only to better manage, but also to reinvent the commons. Thus, to link this to our previous point, repurposing—reworking existing forms of organization not only facilitates the provision of physical resources for building resilience, but also (re)generates novel social relations that support cooperation and strengthen local social infrastructures (Dalakoglou, 2013). These include strategies and modes of interaction to build alliances within and between communities at different scales (Partridge, 2018). This is evident, for example, in the case of Egypt: in Cairo, communities are unable to gain access to sustainable water without collaboration at the building, street and

district level. In times of crisis, connections based on kin, place, and early self-help networks are reactivated, and sustain material reworking of the built environment.

5. Conclusion

Despite the growing focus of critical geographical and political ecology research on grassroots activism (Antonsich, 2013; Auyero *et al.*, 2017; Chatterton and Pickerill, 2010; Schroering, 2019; Scheidel *et al.*, 2020; Thorkildsen, 2018), and grassroots innovations (Seyfang and Longhurst, 2013; Smith and Stirling, 2016), empirical accounts of how collective action and social-environmental movements relate to grassroots innovations and multi-site comparative analyses are still rare (for exceptions see i.e. Pellenc *et al.*, 2019; Temper *et al.*, 2018). Our analysis has contributed to bridging this gap while also proposing a radical reconceptualization of grassroots innovations. In particular, we introduced the concept of *radical grassroots social innovations* and discussed how these can tackle social, spatial and environmental inequalities, engage with the commons and the processes of commoning, and embrace anti-oppression politics by drawing on a diverse set of empirical case studies spanning the Global South and North and four continents.

Our empirical material adds to the analyses of other scholars that have shown how oppositional movements have a key role to play in relation to radical transformations (Pellenc *et al.*, 2019; Temper *et al.*, 2018; Prause and Le Billon, 2020). In several of the cases we explored, communities of struggle (Hamann and Türkmen, 2020) have been able to not only resist the capitalist exploitation of places, sociocultures and livelihoods but to also imagine and often enact alternatives, ranging from traditional agriculture and herding to communal water management, energy production and direct democracy. Importantly, several cases reveal a complex dialectics between resistance, reworking and resilience practices, particularly when viewed through the lens of grassroots innovations, challenging strict divisions between transitional and transformational change (Martin *et al.*, 2020; Pellenc *et al.*, 2019; Temper *et al.*, 2018). Understanding different resistance practices as "interwoven" highlights the fact that everyday, transitional and oppositional practices can often be mutually sustaining (Katz, 2004). This has particular importance in the context of an increasing shift to authoritarian neoliberal regimes that by causing conflicts, dispersion or loss of community empowerment abruptly polarize the politics of everyday life (Apostolopoulou, 2021a, b; 2020a). Nonetheless, this does not negate the need to understand that grassroots innovations –no matter how important they may be for everyday lives and livelihoods– may fail to endure if not linked to practices of resistance. The radicalization of the politics of everyday life is a key indication of the significant role of even seemingly simple resilience practices and of their transformative potential.

We also saw that grassroots innovation does not have to refer to something novel in the dictionary meaning of the term, i.e. "new and original, not like anything seen before" (Cambridge Dictionary⁷). Social movements and affected communities often repurpose and rework older, traditional, and Indigenous forms of autonomous socio-spatial organization, decision-making, knowledge or technologies to address inequalities (Temper *et al.*, 2018). The literature on innovation for sustainability often places more emphasis on the originality or novelty of proposed solutions, and less on reused or repurposed traditional organizational and technological forms. Based on our findings, we argue that imagining alternative pathways often involves recalling and re-inventing a past practice that has remained in the collective memory of communities (Katz, 2004). We, therefore, need to add another element to our definition of grassroots radical innovations: the ability to escape mainstream or apolitical notions of "novelty" by daring to combine new, emerging forms of social and socio-technical organization with traditional skills, practices and knowledges that have historically contributed to the resilience, survival and prosperity of communities.

Commoning, as the process of making and remaking the commons through everyday practices, social relations and spaces of creativity and social reproduction (Clement *et al.*, 2019), is an emblematic example of the latter. The commons not only have a long history in various communities across the Global South and North, but they are also central to today's struggles against spatial enclosure driven by the global hegemony of neoliberalism. As almost all our cases show, they are increasingly important in the context of reclaiming

⁷ <https://dictionary.cambridge.org/dictionary/english/novel>.

the right to the city (Stavrides, 2016), to nature and to space both materially and in the sense of new forms of the commons, embodying new knowledges and forms of cooperation (Apostolopoulou, 2021b; Eidelman and Safransky, 2020). While neither commoning nor grassroots innovations are *de facto* egalitarian and emancipatory, they nonetheless do challenge the production of an increasingly neoliberalized public space and nature, within and beyond cities. Several grassroots innovations explored here, such as guerilla gardening, edible landscaping or communal water management, not only created sites of resistance against racism, urban marginality and social segregation (Apostolopoulou and Kotsila, 2021), but also acted as counter-hegemonic tools to reclaim the commons from capitalist enclosure (Follmann and Viehoff, 2015).

Our case studies also confirm the complex interplay between scale and transformative change (Cotton, 2018; Hoogesteger and Verzijl, 2017) by reiterating the importance of crossing scales, especially for alliance-building, networking with social movements, and seeking more-than-local solidarity, in a process we termed *rescaling*. Importantly, we saw that rescaling is different to upscaling or jumping scales, as it involves the relational production of scale and place (Apostolopoulou and Paloniemi, 2012; Apostolopoulou *et al.*, 2014). Communities of struggle, irrespective of whether they are social movements in the typical sense or affected communities, create their own scales and geographies through practical and discursive engagement with resisting, amending and coping with socio-spatial and socio-environmental injustices. In this process, they create distinct spatial practices and temporal frames through relations with broader arenas and other places (Hart, 2006) but also through the practical engagement in transforming their everyday lives.

We argue, therefore, that rescaling refers to the exchange of knowledge, solidarity, and resources between organizations, institutions and communities across scales but also to the relational processes through which communities of struggle create new scales or territories. Moreover, our cases underline that transformative change and radical grassroots innovations are scaled. Innovations are material and discursive practices that can transform the socio-spatial, economic and environmental conditions of everyday life for affected communities in neighborhoods, villages, urban squatter settlements and more broadly urban space. But they simultaneously exceed the local when they manage to influence regional, national and even international scales. This does not imply a linear, necessarily progressive process: a radical grassroots innovation can be transformative at one scale but may not be at another.

Finally, and crucially, our cases show the increasing significance of linking struggles for nature, space and the commons, as well as the growing links between struggles at the point of production and struggles around social reproduction. We argue that establishing organic links between these movements may be politically challenging but it is more necessary than ever before (Apostolopoulou, 2021b; Apostolopoulou and Cortes-Vazquez, 2019; Harvey, 2012; Massey *et al.*, 2009; Lefebvre, 1991). To achieve lasting, transformative change on the ground, requires explicitly addressing the links between environmental and class politics, together with the politics of gender and race, to advance intersectionality (Apostolopoulou *et al.*, 2021) as well as connecting proletarian, anti-racist and anti-sexist struggles at the point of production with the array of struggles and oppositional movements unleashed by accumulation through dispossession (Hart, 2006). Towards this direction, various processes of dispossession need to be rendered both historically and geographically specific as well as interconnected (*ibid*).

In this article, we tried to contribute to this significant endeavor in two key ways. Firstly, by showing how critical ethnography, intersectionality and relational comparison can forge connections across diverse but interrelated arenas of struggle. Secondly, by moving beyond analyzing mere opposition, to exploring pathways to radically different futures through paying analytical and empirical attention to radical grassroots innovations. Indeed, our decision to focus on the latter stems from acknowledging the need to highlight community practices that have an emancipatory and progressive potential to open pathways not only for opposing inequality but also for radically different post-capitalist futures through, *inter alia*, reinventing the commons.

All the cases explored here offer clear indications of the potential that exists across diverse places, contexts, struggles and movements. We are nonetheless aware that this is not the entire picture of grassroots activism or grassroots innovations. Although our cases reflect the existing complexity, relationships with local and national governments, market, capitalist and colonial interests are often much more perplexing. Our aim,

therefore, is not to offer a simplified, naïve picture of a more just future that will inevitably come. It is rather to add our voices to the increasing calls of militant scholar activists from across the Global South and North, for a radical anti-capitalist agenda in political ecology and human geography research. A philosophy of praxis has the potential to contribute towards this direction by supporting the emergence of theories and politics of a completely different type (Thomas, 2009), that would be in constant exchange with existing movements in their historical-geographical specificity and as they emerge from situated practices (Loftus, 2014). This should not be interpreted as a retreat to empiricism, but as a collective effort to demonstrate the importance of a theory rooted in actually existing radical practice (*ibid*) and, particularly, to those elements of grassroots practices, such as radical innovations, that can offer a glimpse of future, egalitarian and emancipatory social, sociospatial and socionatural relations (Temper *et al.*, 2018).

As a closing statement, we would like to reiterate the importance of thinking about resistance in a more analytical, empirical and comparative manner. Resistance has often become a concept without a concrete meaning, identifying almost every action as political and every oppositional practice as resistance (Smith, 2015). Katz's (2004) analytical distinction allowed us to retain the usefulness of the concept by identifying nuances of resistances outlined in the three concepts of *resilience*, *reworking* and *resistance*. While the latter refers to more conscious attempts to develop emancipatory change through liberatory agendas and transformative practices, reworking applies to negotiations and transgressions to improve people's lives, and *resilience* describes efforts to achieve endurance and survival within oppressive and discriminatory contexts (Katz, 2004; Smith, 2015).

Despite their differences, through our analysis we showed that practices of resilience, reworking and resistance are all part of the repertoire of communities of struggle, as they explore and experiment with both novel and more traditional social innovations to effectively deal with social, spatial and environmental injustices, build solidarity and move towards transformation (Temper *et al.*, 2018). We also highlighted that, despite the inherent challenges in linking different instances of resistance across different spatial and temporal scales, it is imperative to try to cross scale, space and settings through relational comparisons. Drawing such a "contour line" has the potential to link the fates of communities across disparate places by pointing to the connections between North and South, East and West, Indigenous and non-Indigenous, and rural and urban. This defies nationalist logics that have often become the basis of political identification (Katz, 2004; Schroering, 2019). To achieve material change on the ground, vigorous social movements are required that can challenge dystopian neoliberalism and the resurgent TINA (There Is Not Alternative) dogma and open pathways to post-capitalist societies.

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Appendix: Case study descriptions

1. Elder environmental activism, austerity and degrowth: The River Adur corridor, West Sussex, England

In three interconnected waterside villages deep in the English countryside, our protagonists have come recently, but affirmatively, to forms of radical community activism. The triggers of this mostly elder-led environmental activism were a combination of site-specific events (such as flooding, pollution, species change or termination of a local municipal service such as drainage or river management), aggravated by a perceived failure of local and central government to satisfactorily resolve these issues. For the first time in many of their lives, these citizens have awoken to the reality that the state is no longer capable, or willing, to protect them, or their local environments, from extreme events such as flooding and pollution, and from more incremental, but equally noxious, challenges such as biodiversity loss, landscape degradation and over-development.

At a time in their lives when they have been relegated as socially redundant, these community elders are ingeniously using their capacity, their networking, their retirement funds and their physical strength to innovate, radicalize and initiate change in myriad ways: exemplifying Katz's notion of *reworking* (Katz, 2004: 247). They are reworking the system through a very English, mannered form of activism: using social connectivity and cultural savviness to resist state retreat and to fight collaboratively against institutionalized greed. Influenced by ageing, they recognize their work is intra and inter-generational: a sustainable life for them and others is a stated goal. They are quickly learning to resist and reject normative presumptions of their inadequacies, as they learn to champion support through social media platforms, fundraise online and in-situ and use their extra-time and new-found capacity to fill the gaps left by younger activists, busy working or raising families. These social and environmental struggles have clear political and economic drivers. Their activism is closely linked with many orientating principles of the degrowth movement: conviviality; solidarity and a 'nowtopianism' to champion non-monetary relationships focused on a collective spirit of endeavour and support in the here and now. Examples of degrowth orientated elder activism are beginning to surface across England such as the anti-hydraulic fracking protests in West Sussex and Lancashire (Garland, 2018) and food bank initiatives (Caplan, 2016). It would be too simplistic to argue that these elder responses are demonstrating a civic spirit and *esprit de corps*. Rather there is a grim pragmatism behind them, that the British welfare state as they knew it, and attendant forms of public debate and participation, are on the wane due to the ever-onerous demands of living within a neo-liberal society.

The rural elders have responded to these changing governance and ecological environments through purposive actions, such as joining Parish Councils, forming Flood Action Groups, campaigning within Residents Associations and taking part in a wide variety of local voluntary activities and organizations as part of an engaged response. These innovations exist in other spaces, but what is clear from the empirical research is that the very functioning of many English villages is dependent upon the voluntary and coordinated network of elder civic activists. Without these older campaigners, many rural services would cease to exist. Not only do some rural elders replace services (examples include clearing blocked culverts and clearing away autumn debris from roads, gutters and streams to prevent localized flooding – roles that have been inadequately sub-contracted to third parties by local authorities) but they also raise awareness of these retracted services with others in their community and sustain momentum until the issues are addressed (securing funding for local youth groups and flood response kits, for example).

Innovations include river restoration work across often competing interest groups (where anglers and environmental activists worked together to reinstate a riverine breeding habitat); the development of a local Flood Action Group who work with other local and regional environmental groups to educate and campaign around flooding (to highlight that causes of flooding are socially and environmentally complex and include land management regimes, building on floodplains and climate warming through over-consumption); and residents' campaigning organizations who have commissioned expert reports to raise awareness around the complexities of peri-urban and rural drainage management, leading to year-round voluntary activities, as well as a change in local government policy and funding.

The respondents are involved with activism both short term and issue-based, and with longer timelines. Equally some are site and even issue specific and others map onto broader considerations of global concerns. Through engagements with these issues all the respondents interviewed had gained a wider awareness of the need to radically accelerate grassroots sustainability innovations. For those actors involved in a local chalk stream restoration project for rehabilitating brown trout, breeding grounds became a legacy act for the area and for future humans. Factors which respondents have determined as facilitating a positive outcome include putting the species above interest groups or individual politics; undertaking a clear, jointly developed plan of action with an accompanying business plan to think through financial and other contingencies; and ensuring the work was undertaken for the good of the civic parish, not just for a small set of concerned individuals.

Other respondents viewed success around grassroots innovations as something more piecemeal; even the act of drawing wider public attention to an issue was deemed a success. One dominant stakeholder has been the focus of one elder environmental activists' ire. This stakeholder holds great economic and political sway in the local area, and is unwilling to take responsibility for changing their business model to ameliorate flooding caused by their estate. From their perspective as a significant local taxpayer, their mitigation expenses should be matched by the local government who are nevertheless not willing to share the financial and logistical burden. The grassroots innovation from local campaigners was to use social media to keep pressure on these more influential stakeholders and to undertake small-scale mitigations themselves, working between short-term micro responses and macro longer term solutions.

2. Mining and grassroots innovation in Cajamarca, Colombia

In 2017, South African-based multinational, AngloGold Ashanti S.A. (AGA) announced the discovery of a massive gold deposit in Cajamarca, Department of Tolima, central Colombia. They named the deposit 'La Colosa' ('The Colossus'), estimating it to hold around 30 million ounces of gold – the largest gold discovery in Colombia at the time. As soon as the project was announced, people in Cajamarca and neighboring community of Anaime started organizing their opposition to La Colosa. Associations of peasant farmers, young people and environmentalists began to proliferate throughout Cajamarca and Anaime's veredas (villages) as well as in the departmental capital, Ibagué, to organize their opposition. Despite threats, violence and killings perpetrated by pro-mining paramilitaries, the people of Cajamarca, and Tolima more widely, have sustained their resistance for over a decade and succeeded, at least for now, in stopping the mine.

A turning point in this resistance struggle came in 2013, when the small municipality of Piedras, Tolima, organized a "popular consultation" to give local people a say on whether AGA could build the mine-waste dam for La Colosa in their territory. Enshrined in Colombia's 1991 Constitution and fully defined in 1994 Law 136, article 33 on popular consultations reads as follows: "*When the development of tourist, mining or projects of another nature threatens to create a significant change in the use of land, which results in a transformation in the traditional activities of a municipality, a popular consultation shall be held in accordance with the Law.*"

Importantly, unlike many mechanisms for participation or consultation, Colombia's popular consultations are binding rather than advisory, and according to Colombian law, the central government is legally bound to respect the decision taken by the people and municipalities who organize popular consultations. In 2013, the people of Piedras voted against the waste dam and AGA left the area. In March 2017, the people of Cajamarca followed suit and held their own popular consultation on the future of the La Colosa project as a whole. Some 98% of voters voted NO to the mining project, and their democratic stand stopped La Colosa in its tracks. The strategies social movements in the region employed to achieve this landmark victory were many and varied, with diversity being a major strength of the mobilization. Along with using popular consultation, they also created community platforms, regional networks, popular education and non-violent direct action while also actively seeking international solidarity (see <https://spark.adobe.com/page/JOFeSC3h5RtAg/>).

It is important to point out here that long before Cajamarca's successful popular consultation, the organizations that came together to resist La Colosa began promoting non-extractive livelihoods rooted in

Cajamarca's agrarian identity, shaping a new development narrative. Robinson Mejía of youth environmental organizing group [Colectivo Socio-ambiental Juvenil de Cajamarca \(COSAJUCA\)](#) said:

We have a critique of the term 'alternative', Cajamarca doesn't need to find an alternative, rather to follow its roots. We already have a non-extractive livelihood and everything we need, what we want is a more just, agroecological system of food production, a circular economy which doesn't damage the territory.

In line with this approach, several initiatives are underway that seek to strengthen traditional livelihoods and pioneer new economic activities, while respecting the rights of local people and the ecosystems they rely upon. These include

1. Agroecology: food and farming have taken centre stage as the basis for traditional, non-extractive livelihoods. COSAJUCA has supported the development of 18 productive projects, run by women, to sustain and strengthen non-extractive livelihoods in Cajamarca.
2. Community water sources: formed in 2014, the Red de Acueductos Comunitarios de Cajamarca (The Network of Community Aqueducts of Cajamarca) has grown into an alliance of communities managing their access to freshwater and monitoring water quality.
3. Gender equality and care: observing how mining often impacts women far worse than men, during their resistance to La Colosa, women in Cajamarca formed the Peasant Women's Alliance of Cajamarca. Made up of women from all of the *veredas* (villages), the Alliance fosters exchange between women, creating a space for them to share their knowledge and skills, and to support each other in processes of collective healing;
4. Changing the narrative: celebration, art and storytelling have played a constant role in Cajamarca's story of resistance and revival. Every year for 10 years, people in Tolima have organized a 'Marcha Carnaval en Defensa de la Vida' (Carnival March in Defence of Life), in the regional capital, Ibagué. The March has grown each year, and gathered over 120,000 people in 2017.

Cajamarca has countered the typical response towards communities who resist mining from Government and corporations by accusing them that they are "anti-development." However, the people's victory in Cajamarca stands as an inspiration to mining-affected communities and their allies around the world. The cooperative organizing model of youth, peasant and environmental organizations in Tolima – sharing platforms, making decisions collectively and working together on projects and mobilizations has been key in building an inclusive movement, one which has allowed whole communities to engage in and benefit from a broader process of transformative resistance.

Regenerative projects have put a strong emphasis on feminism and agroecology, on strengthening identity, and the spiritual connection with land and the economic autonomy of the communities. These are mutually reinforcing strategies that help ensure the sustainability and perseverance of these transformative movements.

3. Grassroots innovation in San Isidro's community-operated irrigation system, Ecuador

The indigenous community of San Isidro in Ecuador's central highlands is home to just over 90 households, most of whom rely on various forms of wage labor in combination with small-scale agriculture. The landscape around San Isidro bears clear marks of colonialism and ongoing land and water inequalities boosted by historic water concessions: *hacienda* farm estates and food-export plantations occupy most of the flat, fertile land in the valley bottom and have secured industrial-scale water supplies (Partridge, 2016a). Socio-environmental struggles have been mobilized to resist such inequalities and to push for fairer access to

resources. These movements have simultaneously drawn on and reinforced cooperation both within and between local communities. At the same time, agriculture in San Isidro faces challenges from a dwindling land base (due in part to smaller inheritances across successive generations) and the semi-arid (and increasingly unpredictable) climate. Within this context, agricultural production in San Isidro has been transformed since 2009 – when construction was completed on a 20km community-operated irrigation pipeline. This project has reworked both social and ecological relations: requiring renewed commitment to collective decision-making processes and cooperative work; and reviving shared use of communally-owned areas of *páramo* moorland (where the pipeline sources its water). Ethnographic fieldwork has documented the collective dynamics of this project within the broader context of indigenous political organizing and regional environmental justice struggles (detailed in the works cited here).

Experiences in San Isidro underline how community action for projects like the pipeline can then be applied in other struggles and mobilizations (Partridge, 2016b). In this, histories of collective action and working with the commons both play a particularly influential role, helping to generate, facilitate, and sustain local grassroots innovation. The commons in this case refer to material resources (land and water) and social resources (which include directly democratic decision-making processes and collective practices for managing work, accountability, and conflict resolution). Taken together, these social relations and practices can be considered the community's "organizing infrastructure" (Partridge, 2019). Funded initially by a grant from the national government – which was accessed through an alliance of local indigenous communities – San Isidro residents are now responsible for maintaining the irrigation pipeline. While effectively providing free labor to the state, this labor requirement has also demanded cooperative management of the system and has led to a revival of *mingas* – regular days of coordinated, voluntary work within the community. The 'innovation' in this case comes in adapting these elements of organizing infrastructure in order to seize contemporary political opportunities, build networks, and engage in further projects for production and conservation.

Also central to community action in San Isidro is the *asamblea* decision-making process – a political structure (based around the leadership of an elected council and universal participation in community meetings) which has been a contested legal requirement of many registered indigenous communities since the 1937 Communities Law (Becker 1999, Partridge, 2019). Working with neighbouring communities who share the same organizational structure, San Isidro's *asamblea* has cooperated within the local union of 15 indigenous communities (OPIJJ) and with the provincial branch of the national indigenous movement (MICC). In 2009, organizing with other OPIJJ members and supported by legal advice from MICC, San Isidro participated in protests and a legal campaign that successfully mobilized rights to *Buen Vivir* (codified in the new Constitution of 2008 to protect 'Harmonious Living' between society and nature) in order to ban neighbouring plantations from using technologies that disrupted local water resources (Partridge, 2017). Through the *asamblea* and *mingas*, histories and prior experiences of community organizing have supported both network-based actions and the protection of resources within San Isidro itself.

San Isidro has also recently drawn on these networks of cooperation to collaborate directly with the national-level Indigenous organization CONAIE (Confederation of Indigenous Nationalities of Ecuador) in order to protect communally-held areas of the *páramo* moorlands from private interests who wish to exploit the land for industrial forestry or commercial grazing (Partridge, 2020). While all such collective efforts have to both acknowledge and find ways to address internal conflicts, these ongoing campaigns also underline some of the perpetual challenges that Indigenous communities, in particular, encounter. For example, that even when certain (collective, Indigenous) rights are enshrined in the national constitution, due to systemic discrimination within juridical systems, communities and social movements have to work constantly to ensure that those rights are recognized and upheld.

In San Isidro, the shared material and social resources being managed and mobilized reflect the notion of the commons as a basis for enacting counter-hegemonic socioecological configurations from a shared 'material and symbolic terrain' (García López *et al.* 2017). While the protection and preservation of natural resources may be a focus, those actions are part of a broader set of relations that also promote solidarity and cooperation (see Akbulut 2017). These struggles emerge in a context dominated by unresolved historical inequalities in the distribution of land and water coupled with persistent sociocultural marginalization and

violence. Outcomes and objectives of collective action, however, are not limited to specific political goals. Rather, strengthened alliances develop greater resilience and flexibility in responding to political change. The radical grassroots social innovations underway in San Isidro highlight critical questions for further investigation with comparative cases, including: (i) how specific *histories* of organizing shape and support contemporary grassroots innovation; (ii) the role of alliance-building and political networks; and (iii) the mutually reinforcing dynamics of managing shared resources and developing forms of collaborative organizing.

4. Resisting crude oil projects: Grassroots innovation in Izhma region, northern Russia

Northern Komi people living in villages scattered across the Pechora River basin have traditionally relied on subsistence hunting, fishing and foraging. Since the 19th century, they have herded reindeer for subsistence and trade. During the Soviet Union period, the system was reformed into state-planned collective farming. In the 1990s, the state support system collapsed, resulting in unemployment, poverty, and out-migration from the sub-Arctic region. In the early 2000s, Lukoil, a Russian multinational corporation, through its subsidiary Lukoil-Komi, acquired licenses to explore and drill oil in the remote Izhma region, promising bright rural futures.

People in this emerging resource frontier, although striving for a new wave of development, have been cautious about new oil projects being prepared for the worst ('resilience' according to Katz, 2004). Earlier another company attempted oil exploration in the local Sebys nature reserve without public discussions. Then local activists successfully sued the regional governor for changing the borders of the protected area, significant for local livelihoods and conservation, to accommodate industrial activities. The new entrant, Lukoil-Komi, has been notorious for causing extensive pollution in neighbouring regions, including a large land oil spill near the town of Usinsk in 1994. Concerned community members scrutinised Lukoil-Komi's activities in the Izhma region, checking project compliance with the applicable legal requirements, and monitoring pipelines for possible leaks. Periodically, people located unauthorised industrial waste dumps and spills of oil and by-products of extraction processes. The incidents were reported to the company and the government but did not receive appropriate responses. People worried that most of the spills were unknown, fenced-off or intentionally hidden.

The turning point was a 2014 conflict, when municipal authorities failed to organize public discussions regarding a series of new oil projects. Soon after, it was uncovered that the company violated the conditions of licences and project design, reinforcing opposition by villagers. In the past, they resisted state exploitation of free labor, and now they were ready to stand against the large multinational company and protect their communities ('resistance' according to Katz, 2004). During numerous protests throughout Izhma region from 2014 until 2017, people demanded prior consultations about industrial projects, effective response to oil spills, and adequate compensation for the impacts on the environment, health, and livelihoods. Although not recognised as an Indigenous minority by national legislation, a movement of Komi-Izhma people, *Izvatas*, demanded their rights as Indigenous peoples to be recognised and numerous international institutions supported these demands. The socio-environmental movement 'Save Pechora Committee' was also seeking international solidarity by aligning its activities in the Izhma region with the global climate 'Break Free from Fossil Fuels' campaigns by means of social media. Receiving support of national and international human and Indigenous people rights defenders and global environmental and climate movements, the people in Izhma region pressured the oil company into dialogue.

Persistent open resistance has led to a socio-economic development agreement between *Izvatas* and the company, but people were clear that the future of the region is not extractivism. Before the conflict started, a group of women had been advocating for focusing on reindeer herding and cattle breeding in the region to maintain control over development pathways. 'Reworking' (Katz 2004) began with group efforts led by an enthusiastic woman, a former worker of the reindeer herders' cooperative, to help willing community members to establish family units for herding animals, meat production, dairying, and making clothing for exchange and trade within and beyond the region. The main challenge was to obtain basic equipment and

meet sanitary requirements, necessitating external funding. The local aspirations for the 'resurgence' of herding coincided with rural development governmental programs that provided subsidies to support small-scale individual farmyards, reindeer herding brigades, and wood-working shops, enabling even greater inclusivity across families. These include initiatives to work with reindeer skin to produce clothes and souvenirs, and process wild mushrooms and berries that people gather in the remaining pristine *taiga* forest. Given the escalating conflict with Lukoi-Komi, these innovative activities were well-placed to support the local economic base. Tradition and identity became important pillars of local resistance to crude oil extraction.

This case recognizes that social transformations towards more sustainable future occurred in the Izhma region as a result of conflict and oppositional consciousness to the oil industry. The leadership of one woman, and the trust that community members had in her vision, were pivotal for the family farming projects to gain ground as alternative ways of living in Izhma region. By claiming the importance of traditional uses of nature in innovative ways, resistance became more proactive and transformative. This case also highlights the role of the state in sustainability transformations in remote Indigenous communities in northern Russia. While heavily subsidising the oil industry in the Arctic and sub-Arctic, the state also provided initial incentives to develop agriculture in cold extreme environments.

5. Environmental and food justice from the Outdoor Domestic Space: spatial resistance dynamics from Brazil and Mozambique

Recent research findings demonstrate that the self-organized practice of edible landscaping in outdoor domestic spaces drives a silent, popular struggle for community survival and prosperity against historical marginalization, exemplifying the idea of "resilience" (Katz, 2004). The cases are the indigenous Guarani village of Ideia Itamarã⁸, located in Diamante do Oeste, and a second comprising a large urban settlement in Paraná – Ocupação Bubas⁹ at Foz do Iguaçu, both in Brazil. Previous research was conducted in informal settlements in Mozambique (Veríssimo, 2012). Household and community-based practices have been reorganized towards empowerment, assuring livelihoods, food sovereignty and environmental quality, and they are expressions of grassroots innovations in the face of the colonial pressures that occurred in Latin America since the European invasion in the 16th century.

Despite differences in terms of place, origin and background (informal urban residents in Mozambique, and an indigenous village and a large squatter settlement in southern Brazil), households have transformed their use of domestic space and reorganized production strategies to securing their livelihoods. They address the degradation of their resource base, environmental injustice, racism, unemployment and inadequate salaries. In this context, the Outdoor Domestic Space (ODS)¹⁰ that traditionally encloses dwellings has both domestic and social functions. It can produce food, cool and clean air, family income, and social networking. These spaces help residents adapt to environmental problems and resource degradation in scenarios of adversity, but area also vital for livelihoods to be secured.

Empirical evidence contradicts the negative assumptions associated with spontaneous urban expansion, showing that ODS is not only vital for thermal comfort, food sovereignty and securing livelihoods

⁸ More than 42,000 indigenous Guarani were forcedly evicted from their land in the border areas between Brazil and Paraguay during the construction of the Itaipu dam in 1982, as the Paraná River and the Itaipu lake enlarged. People fled to other lands in both countries. Today in Brazil, these displaced people live in seven villages across a fragmented territory with the support of Itaipu and the FUNAI. They are still threatened by agro-industrial, extractivist and real-estate interests.

⁹ Ocupação Bubas is the largest squatter settlement of Paraná, Brazil with 1,200 households and more than 5,000 residents from Brasil, Argentina and Paraguay that were evicted from their lands due to agro-industrial, extractivist and real-estate pressures in 2013. The community, and the Guarani, are afraid of the current political regime in Brazil and its failure to address health and safety, lack of democracy and its authoritarian actions.

¹⁰ Outdoor Domestic Space is where the daily activities of the family take place, involving strong social and productive as well as reproductive functions. The ODS is adapted to integrate both family agriculture and business, creating a green and ruralized urban growth pattern (Veríssimo, 2014). The diversified nature of Outdoor Domestic Spaces reinforces, and in other cases reestablishes, a symbiotic human relationship with nature, that has been perverted by capitalism and western modernization. They are fundamental to ensuring food sovereignty, the resource base for subsistence and the regeneration of natural life, especially in cases of severe adversity.

but also tends to reverse environmental problems related to the lack of infrastructure. Domestic space improves environmental quality, security and sociability in the neighbourhood. Biophysical characteristics and benefits such as shade, greenery, lower air temperatures and improved air quality are inherent to ODS. In addition to providing food and traditional medicine locally, a pleasant domestic and neighbourhood microclimate is sustained. Additionally, the ODS offers commercial opportunities, increasing household incomes and facilitating the social inclusion of more vulnerable groups through neighbourhood and business networking.

In contrast to modern planning, these practices meet the needs of the population, helping them to deal effectively with various urban challenges. In particular, ODS is shaping a 'ruralized' urban form that challenges the Eurocentric modernity of post-modern urbanism and top-down approaches that exacerbate social inequality, urban poverty and racial segregation. Research suggests that through awareness, recognition and collaborative processes, the spontaneous urban expansion arising from spatial struggle and self-reliance can contribute not only to a legitimate and just form of urban development but also to positive environmental change, by supporting non-alienating relationships both among humans and also between humans and non-human nature.

By recovering the community's biocultural memory, the ODS contributes to food sovereignty and environmental regeneration. For that reason, the rights of nature and human rights are respected – the right to housing, to food and to a healthy environment, as well as ecosystem regeneration. Domestic and community food and medicinal gardens support cooperation, mutual aid and solidarity for the common good, a pre-colonial legacy and a survival strategy also found in Mozambique. These gardens are small, and found in *favelas* and traditional settlements. Micro-landscapes, normally managed by women, use local knowledge, and respect agroforestry principles (Name, 2016) and can also provide shade and decrease temperatures (Gillespie *et al.*, 1993; Lok, 1998; Winklerprins, 2002; Mariaca, 2012).

The ODS is a response to scarcity and adversity based on traditional knowledge with a strong dialectical relation with nature, which ensures that 'biocultural memory' continues (Toledo and Barrera-Bassols, 2008). Such spatial resistance (and resilience) can initiate and support eco-social transitions that generate more socially and environmentally just human habitats. Crucially, edible landscaping and the outdoor domestic space have a strong potential to contribute to struggles against hunger, racism, sexism, poverty and overall marginalization by supporting autonomous forms of income, environmental upgrading, and access to food for all. If implemented at a wider scale, they can also become a response to the failure of the Green Revolution and a form of resistance to the hegemonic perspectives of the state, markets and patriarchy that characterize 'development' (Tortosa, 2009; Svampa and Viale, 2014) as the naturalization of inequality.

6. Community gardening in Hellenikon as a resistance struggle against the privatization of public land and the dispossession of the commons in Athens, Greece

Hellenikon community garden is located in a 2,600m² expanse of the former international airport of Athens, in the southern coastal zone of Attica. The story of the garden is intertwined with the attempted privatization of the former airport, a process that started in the late 1990s (see Apostolopoulou and Kotsila, 2021). A key moment was the transfer of the total area of the former airport in the Hellenic Republic Asset Development Fund that was established in 2011. In 2012, a plan for new grey infrastructure was put forward for the privatization and commercial exploitation of Hellenikon that did not remain unchallenged. A citizens' group named 'Struggle Committee for the Metropolitan Park in Hellenikon' was formulated in 2010 and in 2011 it published a declaration opposing the commercialization, divestiture and concession of public land and public facilities to private interests and Greek and foreign capital.¹¹ The Committee developed into a solidarity movement and in collaboration with civil society groups, it used the area for concerts, festivals, and public discussions, hosting, *inter alia*, one of the most successful social health centres in Athens, the Metropolitan

¹¹See <http://parkoellinikou.blogspot.com/>

Community Clinic at Hellenikon.¹² In January 2011, an independent citizens group, part of the anti-privatization struggle, initiated a self-managed community garden by taking over a 2,600m² plot. The Hellenikon community garden was not only as a response to the airport's privatization, but also as an experiment in alternative social organization of urban space. It gradually transformed into one of the most important struggles in post-2008 Greece and a symbol of social solidarity and active resistance to large-scale fast-track exploitation of public land, and the dismantling of social welfare.

The garden's key goals were to develop urban agriculture, redefine food value, conserve genetic diversity, educate its members on organic farming, claim and demand the public character of the airport and to act against its exploitation. It supported solidarity actions by distributing most of its production to the social service of the Hellenikon-Argyroupoli municipality and to homeless organizations. With continuous work, the abandoned space was transformed to a self-managed garden focusing on organic food production, including traditional seeds, vegetables, fruits, and olive trees. The garden's organizational principles made clear that the new relationship with urban space necessitated new social relations. Decisions were taken through open monthly meetings in a democratic, equitable, and anti-hierarchical manner. It was agreed that the field would be cultivated collectively according to the strengths and availability of members and that cultivation would be non-profit. The garden retained communal ownership, without private cultivation or private property rights, and with all products distributed equally according to needs. Its socially progressive characteristics were also evident in the leadership role of women. These principles were not easily implemented, the garden faced profound challenges and confronted the longstanding culture of individualism and fetishization of private property.

Despite these challenges, the garden was very active from 2011 to 2017. Activities included permaculture seminars, festivals, concerts and talks, seeds planting and organic farming, education activities, picnics, creative labs, festivals celebrating solidarity and the cooperative economy, environmental and anti-racist initiatives, school visits and scientific meetings. It managed to gain international recognition and solidarity.¹³ The key factor that led to the demassification of the Hellenikon experiment and the wider anti-privatization movement was that it had to battle the government plans to sell the area. After the Interministerial Committee for Restructuring and Privatization decided to transfer airport shares to the Hellenic Republic Asset Development Fund¹⁴, investment was undertaken in 2014 by Lamda Development S.A. and the Global Investment Group. Lamda secured a deal to "purchase" Hellenikon for 915 million euros nominal value, or 575 million paid up-front. The MoU signed in 2016 with the company declared that the development would not differ substantially from the 2014 investment plan; however, it was never made publicly available. Even the SYRIZA leftist government (2015-2019), whose pre-electoral discourse was aligned to the movement's claims, essentially adopted the same policy as previous governments. This demotivated several participants who realized no government would support their claims. The Investment Development Plan was finally released in summer 2016, leaving only two weeks for "urgent" public consultation of a 2,500 page file that included an Environmental Impact Assessment. The final Master Plan for the development was released in summer 2017¹⁵, when the relevant law had already passed in the Parliament, leaving the overall process of selling out common wealth outside of democratic processes and control.

As activists and experts involved in the anti-privatization movement and the community garden have repeatedly stressed, the persistence in generating such a flagship development has been guided by the developers' willingness to maximize profits through speculation. This ignored long-standing findings showing that economic development projects divert resources from social policies, including public education and housing, contributing to socioeconomic polarization by creating new spatial divisions within cities (Doucet, 2007). Both the Struggle Committee and the community gardeners emphasized the interlinked social-environmental impacts of the large-scale commercial development. The systematic work of the movement delayed the development for at least four years, with the community gardening playing a pivotal role. In 2018,

¹²See <https://entitleblog.org/2018/01/08/the-planned-development-of-hellenikon-a-sacrifice-that-needs-to-be-contested/>

¹³See <https://theecologist.org/2012/jan/10/greeks-reclaim-land-ease-pain-economic-austerity>

¹⁴ See <https://www.hradf.com/en/>

¹⁵ See <https://news.gtp.gr/2017/06/15/lamda-development-submits-master-plan-hellenikon-project/>

the Hellenikon garden entered the Atlas of Utopias of the "Transformative Cities" initiative.¹⁶ Ironically, in the same period the authorities gradually cut the electricity and water supply to the garden, avoiding a direct confrontation that could have caused a strong reaction and attracted support. The maintenance of the garden eventually became impossible. Nonetheless, as its members declared in their closing announcement¹⁷ in April 2019, the garden managed to create a space of coexistence and sharing, of environmentalism, health and food culture, of (re)claiming public green spaces in cities for all, and of resisting the profit-driven privatization of public land.

Today, the garden has gone. On the website of the "Hellenikon Project", the interventions in the area are considered "a new benchmark for urban innovation".²¹ The reference to a public, Metropolitan Park open to all is not mentioned in the official agenda for the site.

7. Mobilizing rural communities against the Keystone XL Pipeline in Nebraska

Within the United States environmental movement, the proposed Keystone XL oil pipeline (KXL) became a popular symbol of opposition against widespread energy project encroachment into local communities. With the rapid expansion of natural gas exploration in America since 2005, site-specific energy projects and energy transportation projects have encroached upon communities across the United States, threatening environmental and citizen safety. The opposition movement that emerged in rural Nebraska to fight the KXL pipeline was unexpected for the developer, TransCanada. Despite being sparsely populated, with mostly Republican voters, and certainly not a hotbed of civil disobedience, rural Nebraska became the epicenter of citizen opposition to the pipeline project.

Rural communities in Nebraska are defined by the agricultural industry, with many farms and ranches passed down through generations as family legacies. Most of the communities located along the proposed KXL pipeline's path had no experience mobilizing or engaging in political action. Rural communities in Nebraska, tend to identify with politically conservative values, and it is common that climate change and environmental issues are not core issues for conservative Americans. While the KXL pipeline (an energy transportation project) may not seem like an "environmental problem", the threat it posed to natural resources like the Ogallala Aquifer was a serious environmental problem for farmers and ranchers, and the exploitation of the tar sands in Canada feeding the pipeline is among the most polluting forms of energy production. What makes the case of community opposition to KXL in rural Nebraska interesting is the fact that it begun with such strength and commitment. How did a small, unlikely alliance of farmers, ranchers, Native Americans, environmental activists, and concerned citizens come together to fight a well-funded, and politically connected energy corporation? The simple answer is citizen concern about the Ogallala Aquifer and Nebraska Sandhills.

Most of Nebraska sits atop the Ogallala Aquifer which provides fresh water for the farming and ranching industry, the major economic activities in the state. The Sandhills of Nebraska represent the largest natural dune formation within the United States, covering most of central and western Nebraska. The many grass species in the Sandhills are ideal grazing for cattle.

Agriculture also defines politics in rural Nebraska. In the case of KXL, there was a disconnect between rural citizen's need for political representation, and the obligations of elected officials at the state level. This disconnect was apparent when several state representatives openly advocated for the pipeline at public comment hearings and worked to shape legislation designed to favor TransCanada's profits over community safety.

Because Nebraska's economy is not dependent on oil or petroleum production, the pipeline had to be 'sold' to Nebraskan citizens. TransCanada's political and economic influence campaign was extensive, including TV advertisements, political contributions, and a broad public opinion campaign. The investments in building the KXL pipeline were massive, and the interests involved in approving and building the pipeline were not concerned with Nebraskan livelihoods. Due to perceived bullying and mistreatment of landowners

¹⁶ See <https://transformativecities.org/atlas-of-utopias/atlas-61/>

¹⁷ See <http://agroselliniko.blogspot.com/2019/>

by TransCanada's agents, the public influence campaign was ineffective and damaged the image of the company.

The grassroots resistance movement that emerged against KXL in rural Nebraska was led by Bold Nebraska, formed by Jane Kleeb in 2013 to advance progressive politics in the state. The KXL pipeline project was not a core issue for Bold, until Kleeb attended a public scoping meeting about the pipeline. After witnessing people express their concerns and knowledge on the pipeline, Jane decided to make the issue a core aspect of Bold Nebraska's organizing efforts.

Around 100 individual landowners living along the proposed pipeline route, mostly farmers and ranchers, refused to sell portions of their land to TransCanada. These landowners composed the core group of opposition members, but they also had significant extended support from surrounding communities. Bold's strategy to attract and organize landowners consisted of multiple tactics: cultural, economic, political, and legal action.

The culturally resonant aspects of Bold's organizing efforts are key to understanding their success. Crop art, outdoor concerts on a local farm, a renewable energy barn raising, the planting of sacred (Ponca Tribe) corn, and many other events directly tap into diverse Nebraskan cultural heritage. The culturally economic aspect involved grassroots resource mobilization, not corporate funding.

Due to the scale and scope of the KXL project, Bold was able to recruit and organize landowners from several communities located along the route. The composition of the opposition movement was politically and culturally diverse. Many of the people who attended Bold Nebraska's informational sessions, which were typically held at community libraries, were older farmers and ranchers, while the Bold staff was mostly younger farmers and ranchers. Several younger Bold members were also members of the Nebraska Farmers Union. In northern Nebraska an alliance between Native American members and ranchers was formed to fight KXL, calling themselves the Cowboy Indian Alliance (CIA), and several members of this group were also members of Bold.

Bold Nebraska did a lot of work to educate and inform landowners through educational sessions, cultivating an oppositional consciousness, what Katz (2004) refers to as *resistance*. Bold channeled this oppositional energy into culturally creative forms of resistance, rather than violent forms of opposition. These educational sessions covered safety information about the pipeline, landowner legal rights, and other topics like tars sands extraction practices in Canada.

While most Bold Nebraska members from rural communities would not identify as liberal or progressive, they are less likely to identify with reactionary forms of conservative politics. While the geographically specific nature of the KXL struggle and inherent cultural qualities of rural Nebraska may have created a disconnect with larger economic critiques of capitalism and neoliberalism, operating at the grassroots level and focusing on local concerns allowed Bold Nebraska to mobilize and engage citizens in communities that had little to no experience with collective action.

Another key to Bold's success was their decision to form a legal arm of their organization called the Nebraska Easement Action Team (NEAT), which provided free legal advice and representation in lawsuits against TransCanada and the state of Nebraska over the course of the KXL fight.

Bold Nebraska did not disappear after President Obama rejected the building permit in 2015. In fact, the organization has expanded its model and formed the Bold Alliance, with affiliate branches in other states. The KXL issue helped Bold grow into a robust and well-functioning organization, and they have remained committed to grassroots mobilization tactics.

8. Auto-construction community systems: Mitigating water shortages in Giza, Egypt

Located at the Western periphery of the Greater Cairo metropolitan area, the Giza governorate has experienced rural-urban migration over time, that changed Giza's agricultural villages into large informal peri-urban settlements feeding the city's informal labor market (Sims, 2012). One of its districts, the Faisal district, consists of planned and unplanned areas with some of Cairo's largest population densities, such as the areas of *Talat Tawabe'*, and *AlSafa w AlMarwa*, where the interlocutors for this research resided. In many of these

areas, the state has intervened to install formal infrastructure systems, yet many households continue to depend on innovative grassroots collective community systems, especially in the case of water.

Residents of Faisal do not recall a time in the period between 2010 and 2015 when they did not have water worries. During the 2015 summer, they received an average daily water supply of two hours, usually between 4 and 6 am; sometimes with severe delays. For example, in July 2015, there was a 5-day dry spell just before the much-anticipated *Eid* celebrations. Disgruntled residents resorted to organizing a protest on the nearby Ring Road highway to capture the state's attention. When state officials arrived on the scene to reason with the protestors, they gave tired explanations for the dry pipes: "others are stealing your water" (resident's interview). While the state blames informal water systems for Giza's shortages, state resources have prioritized watering suburban elite desert enclaves through large-scale infrastructure projects. While construction continues, Giza's residents still experience severe intermittent supply that impedes their everyday lives, and increased local community organizing and conflict.

'*Gehood Zateya*' and community organization

In both the Tawabek and AlSafa w AlMarwa areas, self-help systems shape community responses to contemporary water shortages that are based on notions of resilience and solidarity (Katz, 2004). One family recalls working the settlement's fields 24 years ago, and their daily labor to access water through a hand pump to reach groundwater. At that time, they would dig 25 meters to access a fresh water supply, but as the settlement grew, residents decided to install their own system of pipes from a nearby agricultural village. Several streets in the area participated in collecting funds to install community-bought pipes and establish a maintenance fund that employs a local faucet controller (resident's interview). Despite the considerable expense, residents opted to increase their resilience and self-organizing capacities by investing in these *ashwa'i* (random/informal) pipes, which would become a source of survival and silent protest against the state in later years.

In the mid-2000s, the government installed a water system, and most residents removed their *ashwa'i* lines and hand pumps. They opted for regularization and succumbed to the discipline of water metering and centralized tariffs. Yet, although supply problems were common during this time, 2010-2015 was particularly brutal. Residents realized that their only source of relief lay in their traditional *gehood zateya* (collective and individual efforts).

At the advent of water shortages, Tawabe' households had to employ what Katz terms a "processes of reworking", redirecting or reconstructing what was available, which in turn sparked a political consciousness (Katz, 2004, p. 247). For instance, households recently installed groundwater piping or upgraded their hand pumps, known as *toromba*. Local contractors either reuse older hand pumps or opt for larger water pumps to reach to a 40 meters depth. Residents also resort to traditional forms of community organizing, electing a community leader to collect funds, hire contractors, and oversee the installation process. A plumber oversees the proper installation of these pumps to ensure a dual supply from both the state and *ashwa'i* supply lines. Similarly, residents in apartment blocks in AlSafa w AlMarwa have resorted to adapted versions of groundwater piping to satisfy their water needs. The *gehood zateya* process requires more community interaction so that these pipes can reach increased depths (residents' interviews). A building collector is appointed and a contractor buys pipework, also digging worn and installing or repurposing water pumps. Although residents have heard cautionary tales about the quality of groundwater, all respondents believe that this water is needed for survival in the absence of a stable supply.

This study of informal citizens' everyday practices illustrates an important aspect of innovation, where residents on the one hand "rework pragmatic solutions" to their conditions, but also begin the process of becoming political subjects (Katz *et al.*, 2004). Although these practices have been characterized as a quiet encroachment by the poor or as 'non-movements' (Bayat, 2013), this everyday 'sidelining' of the state in many cases transforms into different forms of direct confrontation (Abdelrahman, 2015). As a Giza Water Company employee confirms: "all these areas have been self-serviced for years", indicating community capacity exists in Egypt, and across the Global South, to build networks of resilience and rework the fluidity of their citizenship (Katz, 2004). These *gehood zateya* innovations are thus critical to deciphering the ways in which

communities are re-inventing their relationship with nature and disrupting the state's uneven production of the environment.

9. Afungi community compensation and relocation, Mozambique

The Afungi peninsula is located in the Cabo Delgado province in the north of Mozambique, approximately 2000 miles (3,219 km) north of the capital city Maputo, and close to the Tanzanian border. The province is a stronghold of the ruling party, with Frelimo taking 80% of the vote in 2015, and it is the home constituency of President Filipe Nyusi. Historically, the region has long been connected to global economies as a colonial trading centre, home to the Niassa Company that managed the territory for the Portuguese colonial state. The province is infamous in Mozambican political history for being the location of the first shots fired by Mozambican revolutionaries in the battle for independence from Portuguese colonialists. Post-independence, the region's historical economy is one of agriculture and tourism (including a recent major Chinese forestry concession and growing tourism facilities), until, in 2010, US oil and gas company Anadarko and partners discovered 100 trillion cubic feet (28 million m³) of natural gas in the region's coastal waters, reported as "enough fuel to build the world's second-largest LNG plant" (Bloomberg Business June 14, 2013). The gas fields are projected to be transformative for Mozambique, expected to be worth US\$3 billion per annum to the state by 2030. The Mozambique LNG projects represent the world's most valuable two oil and gas sites, second only to Russia's Arctic LNG-2. Consequently, the extraction project is pursued aggressively by the Mozambican state and the companies involved.

While this gas find is of significant interest to the Frelimo government and international investors and markets, this case focuses on the Afungi residents presently occupying the site. US oil and gas company Anadarko has been granted permission by the Mozambican state to build a 66,253 hectare gas processing plant on the Afungi Peninsula, the largest such facility in Africa. The proposed facility, which is intended to include several processing 'trains' along with supporting infrastructure including offices and an airfield, also requires community relocation of 566 households (around 1,500 people) to new accommodation nearby, and provides replacement agricultural land for the displaced and for a further 952 households (Mozambique Gas Resettlement Project, 2016).

Although the region is changing fast, these residents often live traditionally, focusing on cashew nut production and fishing for their livelihoods. For these residents, Anadarko's proposals are highly contentious. Opposition to the plant began around 2012 when Anadarko was granted land use permission by the Mozambican state for the processing plant and, according to land rights activist Alda Salomao, began work on the project without consulting local communities or offering compensation (Salomão, 2015). It is important to understand that residents' concerns are nuanced and are not as simple as opposition to relocation. Community concerns fall into two broad categories. The first concerns the distribution of benefits from the plant. Communities are concerned about the loss of agricultural land and access to fishing zones, and suspicious of promises that they could find work at the plant. These concerns are about distributive justice, related to community desires to protect their livelihoods rather than see the huge profits go only to overseas companies and the state. They were also concerned about how Anadarko gained its land rights, that is, a procedural justice question. Several informants stated that it has been commonplace for government officials to assist companies in gaining land rights for extractive and industrial projects in the easiest way possible, regardless of community rights, and that this informal approach was initially taken by Anadarko.

Distributive and procedural justice were central to a civil society campaign which centred on making communities aware of their strong position under Mozambican law. Community paralegals were trained and established community committees for each of the three affected villages. These paralegals and communities pressured Anadarko by refusing to grant community consent, effectively bringing Anadarko's project to a temporary stop in 2013 and 2014, as well as publicly calling the Mozambican state and Anadarko to account for their professed commitment to the rule of law and to good business practice in the media (Salomão, 2015). In June 2015, the civil society coalition contested the resettlement program in the national courts, and successfully achieved a significant financial compensation package. Civil society activists have celebrated

the campaign as a clear victory. Yet, the resettlement plan continues and Afungi communities have not been able to prevent their relocation.

This case can help to draw out two key issues when considering activism and resistance to major capitalist extractives-based development. The first is that the law matters: Mozambican law, at least on paper, affords strong legal protections to communities, and the civil society coalition was extremely effective in engaging with communities on this basis. In the words of one activist, they went to communities and said "this is what the law says: you should read it" (interview with civil society organizer, October 2014, Maputo). This is important because neoliberal development hinges on the production of a so-called good business environment and the respect of the rule of law as enforced by the state. As Mozambican activists continue to discover, this can afford them leverage in the face of 'mega projects' that are increasing in scale and pace through making communities *visible* and *legible* to the state and its private partners; in essence, calling the state to account over the rights it says it gives communities.

The second point concerns the nature of victory. It is significant that the communities are still due to be relocated, and state harassment of activists and community paralegals reportedly continues as it was throughout the campaign. In this sense, communities have influenced, yet ultimately been unable to reshape broader development pathways towards large-scale extractivism and industrial development. Rather, they have invoked their rights and secured some concessions within a dominant neoliberal legal-economic framework – in which rights can always be reduced and revoked unless there is continual vigilance. The case highlights how incremental activism can provide a productive political terrain, even as it ultimately confirms the power of capitalist development dynamics.

10. Low-impact living in England

Low-impact developments (LID) are a form of living where houses are built from recycled, local and natural products, supplied by land-based livelihoods (Chatterton and Pickerill, 2010), in an effort to achieve "low or benign environmental impact" (Fairlie, 2009, p. 2). It is a radical holistic approach that is concerned with personal and emotional sustainability and education as well as seeking to provide more affordable housing options (Fairlie 1996; cited in Chatterton and Pickerill, 2010). LIDs have been considered an extension of the back-to-the-land projects of the 20th century, but for many they are much more than that because they challenge the fundamentals of housing development and its cost, as well as many aspects of the existing planning system (Chatterton and Pickerill, 2010).

Here we explore two case studies of LID in the UK: Diggerville and Woodville (see also Levy, 2019) to illustrate innovations encapsulated in Katz's idea of *resistance* (Katz, 2004: 251). Both cases of LID built critical opposition to the social and environmental dynamics of capitalism, producing counter-hegemonic socioecological ways of living.

Diggerville is a permaculture project and a registered co-operative established outside of a National Park (Levy, 2019). The project was born from some of the founders' environmental activism, and they were looking to protect nature through alternative ways of living. In 2003, using funding secured from the co-operative members and external sources, they bought a 42 acre (17 ha) site. The group first spent time getting familiarized with the land to find the ideal location for their dwellings and community needs, before moving in and making it a reality. The community is now mostly self-reliant, generating its electricity from solar PV panels and mini windmills, gathering water from a borehole and capturing rainwater, and growing a significant amount of its food by using compost from its composting toilets. After years of legal processes, Diggerville was awarded permanent planning permission in 2016, which allows them to live on their site indefinitely.

Similarly, Woodville was established first as a housing co-operative and then as a workers co-operative by environmental and social justice activists looking to set up a low-impact community (Levy, 2019). They purchased 32 acres (13 ha) of plantation woodland within the same National Park as Diggerville. The community met 80% of its needs from their land, building their own dwellings from local materials and composting their own waste, using it for food production. The community also designed its own water system, which included a bathhouse with an efficient water system. Furthermore, they actively worked to conserve

the woodland by removing invasive species, planting species to attract pollinators, and running conservation education days. However, Woodville was rejected permanent planning permission by the National Park Authority and was ordered to dismantle its homes in 2017, on the basis that the community has a damaging impact on the appearance and biodiversity of the national park. The community had ample support, and prejudicial objections were contested.

These case studies describe ways in which social and environmental grassroots innovation can develop as a form of resistance to the socioecological inequalities of capitalist development, and how it can be facilitated or halted by government authorities. LID communities have found collaborative means to meet their needs in terms of energy generation, transport, food and housing with less reliance in fossil fuels or monetary exchange. To do this, they have developed the knowledge necessary to live lightly, with diverse skills as farmers and builders. They adapted their behavior to a post-capitalist way of life, with alternative community dynamics and decision-making processes. They exemplify the realities of social cohesion and innovation that are required for economic degrowth.

As a whole, these examples of LID offer a glimpse into the possible grassroots alternatives to neoliberal webs of exploitation, and also to the means needed to achieve them. They financed their projects, gained access to space, found knowledge, skills and resources, and in one case, gained institutional approval. They illustrate grassroots potential for cooperation, innovation and possibility in a post-growth world, Katz's "vision of what else could be." (2004, p. 253).

11. Anti-privatization struggle and commoning innovations in Stagiates, Volos, Greece

«Σαν το νερό των Σταγιατών δεν έχει, όποιος το πίνει πολεμάει και αντέχει»

Stagiates is a small 17th century village with a population of 70 people, 10km north of the prefectural capital Volos in Magnesia, Greece. It is built at an altitude of 400m on Mount Pelion, and is famous for its high-quality water from Krya Vrysi spring (Cold Spring). The mountains of Pelion are well known for their crystal clear springs that give life to the small villages of the area. Cold Spring is less than 1km from the village. Springs in the area have been traditionally self-managed by local villagers who have been using them in a sustainable way for decades, either for ensuring water supply for the villages or for irrigating their crops. They also serve as a place of commoning and social encounter, with local communities organizing celebrations and cultural activities for themselves and for visitors. The spring is, therefore, closely tied into the existence and social life of the village.

The first attempt to commercialize the spring's water goes back to 2009, when it was blocked by the local council. During the summer of 2011, the municipal authority chlorinated water extensively, although it some said the spring water had obtained a certification that confirmed its quality. The residents continued to maintain and clean the pipework from the spring themselves. In 2020, the municipal authority cut off supply to the village from the spring entirely. Volos municipality connected the village to a network of unconfirmed quality, with water that was unpotable due to high chlorine content. It was soon made clear that the motivation of the local authorities was to question the quality of the water as a pretence, to obtain control over it and then proceed with its privatization. Through chlorination and cutting off local access, authorities could record and control natural water sources. This was not a decision based on local needs; fresh water was valuable for profitable public-private partnerships in the area.

It is crucial to emphasize here that the local community of Stagiates has proven resilient for years by maintaining and cleaning their longstanding water network for years, even sending spring water for chemical analysis at regular intervals. As in the majority of similar attempts globally, authorities insisted that villagers' actions were inappropriate, and they tried to weaken local resistance to the privatization of communal water sources, along with the local media that was supportive of the government. This has, *inter alia*, included a direct questioning of the validity and environmental impact of communal water management. The response

has been growing community solidarity, despite the numerous efforts to intimidate and question local people. This growing solidarity has been a major obstacle.

The Stagiates case is not an isolated one. The outbreak of the financial crisis in 2007 has in many cases accelerated privatization, as local and foreign businesses and particular capitalist interests have sought to expand into new areas of capital accumulation for profit. Part of this involves bottling and selling spring water, and handing water distribution networks to private interests. If water becomes a commodity, community rights suffer.

The struggle in Stagiates was part of a regional movement, the 'Citizens' Movement of Pelion and Volos for Water', dating to 2010. One of its key goals has been to stop commercialization and privatization plans, and raise public awareness about the major issues of environmental and social justice that emerge from neoliberal government policies. They have used support resolutions, rallies, and cultural and political events. They have organized music festivals¹⁸ in collaboration and solidarity with other water movements across Greece and internationally, including those in Brazil, Ecuador, Uruguay, Colombia, India, the USA, and Germany. The core idea is to form a grassroots alliance in Greece that will be able to formulate a comprehensive water management plan based on communal (public) ownership of water sources, building on the rich experience and traditional knowledge of the local communities in villages and cities from years of water self-management.

In Stagiates, the innovative grassroots practice of self-organizing and self-managing common water sources and communal spaces has been expressed emblematically in the participation of almost all villagers, of all ages, in decision-making. Local communities have so far responded with organizational strength and solidarity, defending not only their (social) right to access spring water, but also resisting the privatization of public goods and the commons. So far they have explicitly placed at the core of their struggle issues of social-environmental and socio-spatial justice. All villagers can be meaningfully involved in collaborative decision-making, regardless of class, gender, ethnicity and sexuality, and including working class individuals, immigrants and the LGBTQI community. This illustrates resistance to racism and marginalization, and a counter-hegemonic tool to reclaim the commons from capitalist enclosure, achieving community empowerment and communal ownership of natural resources and public space.¹⁹

12. Community struggles against wind farms in Greece (Agrafa, Crete, Kythira, Aegean Islands)

Greece is an emblematic case for exploring how contradictory governmental energy policies have fuelled public protests and grassroots initiatives about energy, climate and social justice. Public opposition has been strong against wind farms, particularly over the last two years. In 2008, Greece drafted the Special Spatial Planning and Sustainable Development Framework for Renewable Energy Systems (RES), which has guided the installation of wind turbines. Wind farms have been spreading across Greece and more than 16,000 applications have been submitted for turbines over 100 meters high, with 73% of them planned for protected natural areas, islands, forests and mountain ridges. Local activists have emphasized the paradox of undermining the national legislation for biodiversity conservation in order to achieve climate adaptation goals through renewable energy. Vast areas of land in remote island and mountain regions have been acquired for the construction of wind turbines, including protected areas, Natura 2000 sites and some of the most pristine Alpine ridges in Greece (e.g., Agrafa). Most constructions require new roads and the expansion of existing road networks, pylons, transmission cables and huge concrete bases.

Local grassroots initiatives have made two questions central to their critique and opposition: firstly, whether the current designation and implementation of wind farms in Greece affects positively or negatively the fight against climate change; and, secondly, whether "green" investments highly promoted and subsidized by the state worsen or improve landscape and nature conservation. All the communities the researchers talked to in Agrafa, Crete, Kythira, and the Aegean Islands strongly believe that the current direction of energy

¹⁸ <https://www.youtube.com/watch?v=ytvmaHn8Pzc>

¹⁹ See here for a documentary for Stagiates: <https://www.youtube.com/watch?v=8sSt-BvTSN0&t=208s>

investments in Greece, and primarily the construction of wind turbines, will negatively affect policies to combat climate change while having significant and possibly irreversible impacts on natural ecosystems, landscapes and local communities. These include the irreversible degradation of habitats, deforestation and soil erosion, increased fire risk, noise pollution and destruction of their cultural heritage. Seeing the landscape as inextricably linked to their own identity, they perceive and experience its alteration as a direct intervention in their lives.

The primary goal of grassroots movements in Greece is to question the country's overall energy model, and to resist and prevent the mainstream discourse and governmental policy on the "green energy transition." Seeing it as a neoliberal strategy leading to the privatization of public land and the transformation of localities and protected areas into industrial zones, movements argue that the industrial-scale exploitation of wind energy is imposed by the Greek government and the EU. In some ways the model resembles the sorts of extractivist mining projects found in the Global South.

In Greece, this energy model primarily supports large investments by the government that benefit private national or multinational companies, leading to the exploitation of public land and resources without adequate environmental and social impact assessment, and with no proper consultation with residents and local authorities. Some of the key demands of local grassroots initiatives include stopping the approval of new applications until a new special spatial framework for RES and special environmental studies for protected areas are complete, and actively include local communities in fair and inclusive decision-making.

Importantly, several grassroots groups are also trying to formulate comprehensive alternative proposals to current energy production and consumption patterns. They offer a broader critique of green growth and mainstream sustainability discourses. As several interviewees told the researchers, they believe that no solution is possible without a broader and radical shift towards a different energy production model. The installation and operation of conventional and renewable energy sources needs consideration in terms of their impacts on communities, alongside questioning governmental policies and the broader institutional framework of energy production, supply, distribution and consumption. Many of the communities we talked to already experiment with the use of greener energy technologies and techniques based on alternative institutions and provision systems, including wind cooperatives and community-based climate adaptation plans and initiatives for sustainable energy transitions. Their consciousness has evolved, arguing for a just and social-ecological sustainable energy transition. Power and property relations need reform, with a complete re-organization of energy systems based on democratic, collective and de-commodified models for energy access and distribution (see also Pellicer-Sifres, 2020). They would respect sociocultures, cultural heritage, places, memories and history.

Finally, and importantly, through their local-based struggles and by building broader solidarity networks, communities resisting the installation of industrial scale wind farms in Greece created resilient support mechanisms, and reworked themselves as political actors. The majority of grassroots movements demand changes not only restricted to the areas close to them, but across the country. Indeed, most movements and initiatives have managed to maintain strong roots in local communities while establishing solidarity with other similar grassroots initiatives across the country, social-environmental movements, civil society organizations and scientific bodies. As they explained to us, building broader solidarity networks and strengthening collective action and direct democracy is crucial not only for resisting the unequal impacts of controversial energy projects, but also for formulating effective alternative strategies. They demonstrate the potential of a new emancipatory politics that would place the "right to energy justice" at the core of social-environmental struggles.

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