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Transcending the urban|rural divide

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Contents

4 Editors' Note

Yanin Kramsky, Giselle Mendonça Abreu, and Priscila Coli

6 Challenging the Urban/Rural Divide: Implications for Contemporary Planning Theory and Practice

Abigail L. Cochran

18 Transformative Practices Within Mechanisms of Control: "Recognizing" Unrecognized Arab-Bedouin Villages at the Rural-Urban Fringe

Abra Berkowitz, Sarab Abu-Rabia-Queder, and Daniel E. Orenstein

50 Feudalism in the Age of Neoliberalism: A Century of Urban and Rural Co-dependency in Lebanon

Anahid Zarig Simitian

68 Landscape Entanglements: Toward a Descriptive Project for Planning Research

Joseph Heathcott and Kevin Rogan

100 Urban Bites and Agrarian Bytes: Digital Agriculture and Extended Urbanization

Timothy Ravis and Benjamin Notkin

124 (2018–2020) Doctoral Dissertations and Master's Theses

Editors' Note

YANIN KRAMSKY, GISELLE MENDONÇA ABREU, AND PRISCILA COLI

The urban/rural divide has evolved significantly since its conception. What work does it do today? From American presidential election results that mapped onto urban and rural spaces to the urbanization of rural land along India's highways, multiple and complex contemporary conditions challenge and/or entrench our understanding of urban and rural divisions. As the financialization of agribusiness and mining ventures increases across Latin America, what persists or has been blurred in the linkages between urban and rural? Do these concepts still hold explanatory power? What are the values and limitations of this dichotomy? How do representations of the urban/rural divide shift as boundaries are mapped? What do emerging planning practices and informal interventions illuminate about the urban/rural divide and rural-urban transitions, both in the Global North and South?

The Call for Papers for Volume 31 of the Berkeley Planning Journal invited academics and practitioners to engage these questions. Submissions came in from different parts of the world, and in the form of original research, literature reviews, and one photo essay. From the United States to Lebanon, Bedouin villages to digital agriculture, the diverse contributions to this volume uncover urbanization patterns, planning practices, and forms of livelihood that challenge the boundaries between urban and rural in different ways. Importantly, the articles reveal uneven processes and landscapes that eschew teleological narratives of progress that have commonly outlined linkages and transitions between rural and urban spaces, economic dynamics, and ways of life. Taken together, they invite us, instead, to think how 'urban' and 'rural' have been recombined in the contemporary moment.

This volume begins with Cochran's review of human settlement patterns in the United States and the argument that actual distinctions between urban and rural lands no longer exist in contemporary contexts. Instead, new conceptualizations of urbanization can inform post-urban/rural planning. Next, we follow Berkowitz, Abu-Rabia-Queder, and Orenstein to Israel's Negev/Naqab Desert, where the authors employ planning theories from the Global South and North to analyze a case of state planning for Arab Bedouins, an indigenous ethnic minority in the region. From there we turn to Simitian, who examines nineteenth century to modern migrations, demographic shifts, and financial systems in Lebanon in order to understand the relationship between urban and rural spaces. What follows is Heathcott and Rogan's photographic essay that explores locations where 'urban' and 'rural' descriptors cannot capture man-

ifold, shifting, and unstable landscape forms. We end with Ravis and Notkin's critique of digital technologies that are deployed as a 'data fix' in solving the crisis of capitalist agriculture, and the transformation of vast, interconnected landscapes these technologies enable.

Challenging the Urban/Rural Divide: Implications for Contemporary Planning Theory and Practice

ABIGAIL L. COCHRAN

Abstract

Defining the American urban form relies on a perceived division between ‘urban’ and ‘rural’ areas. I trace the idea of the urban/rural divide through the evolution of human settlement patterns in the United States from the nineteenth century onwards. I argue that while a superficial distinction between urban and rural land was once relevant to characterizing city forms and metropolitan growth trends, in contemporary contexts there no longer exists an actual separation of lands based on their ‘natural’ character around cities. Thus, continuing to plan for urban/rural areas ignores how pressing planning concerns arise from greater socio-ecological processes, and places that extend beyond designated settlement boundaries. I explore how new conceptualizations of urbanization, including urban sustainability, urban resilience, and planetary urbanization, can inform a post-urban/rural divide planning paradigm.

Keywords: Urban/Rural Divide, Planning Theory, Urban Sustainability,
Urban Resilience, Planetary Urbanization

Introduction

Urbanization is a complex socio-spatial process characterized by the growth of cities, and a transformation in the spatial distribution of the human population from rural areas to urban areas (“World Urbanization Prospects: The 2018 Revision” 2019). Reports of increasingly rapid urbanization, and estimates that more than half of the world’s population lives in urban areas, have led some authors to claim that we are living in an ‘urban age’ (Brenner and Schmid 2014). Known as the urban age thesis, this assertion is problematic, due not only to methodological critiques that we cannot properly measure urbanization but also to conceptual critiques regarding what is ‘urban’ and what is ‘rural.’

In American history, urban areas have generally been defined in relation to what they are not, using dualisms like city/country, developed/natural, and urban/rural. I argue that while this approach may have been historically productive for urban planning and development, it has become less useful in contemporary contexts. In fact, planning around the urban/rural divide, and classifying land based on people’s interactions (or lack thereof) with nature, may now be counterproductive to developing cities in a manner that recognizes the delicate interplay of coupled human and natural systems and global anthropogenic impacts on the environment.

Modern processes of industrialization and urbanization have increased the intensity and complexity with which humans have transformed wildlands into managed ecosystems (Ellis 2016). This has decreased the presence of wilderness across much of the globe, and especially in proximity to growing cities. In the absence of evident, bounded natural land around human settlements we are left to conceptualize cities without a clear non-city contrast. This destabilizes the traditional dualistic notions used to guide city planning and classify urban forms, including the urban/rural divide.

I argue that the urban/rural divide has lost its importance as a defining characteristic of the urban form of American cities, and that it should no longer serve as a guiding construct for conceptualizing and planning cities. Historically, the urban/rural divide was useful for designating rural land and wilderness areas apart from cities. These areas were reserved for interaction with nature for purposes of work, for those in the business of natural resource extraction, or leisure, for typically white, middle- to upper-class individuals seeking a temporary escape from life in built, densely populated urban cores. Presently, the relationship between humans and nature in cities has changed; most Americans no longer rely on local production for subsistence, global ecological concerns indiscriminately affect people everywhere, and it is widely accepted that a notion of nature, from which humans are entirely removed, represents a false construct (Cronon 1996; McKinney, Ingo, and Kendal 2018).

With this in mind, it is no longer relevant to debate the urban/rural dichotomy, for it relates to an old conceptualization of urbanization in which the growth of discrete urban areas disturbs proximate rural, natural surroundings (McIntyre, Knowles-Yáñez, and Hope 2000). Modern urbanization impacts intertwined social, economic, and ecological processes at many scales. For this reason, Brenner and Schmid (2014) argue that the urban age thesis, as it constructs urbanization as a process characterized by rural-to-urban transition, ignores these common processes and “divides the indivisible” (747). These authors further critique the urban age thesis based on “chaotic conceptions” and “hegemonic understandings” of the urban and urbanization, which reproduce problematic notions like the urban/rural divide (Brenner and Schmid 2014).

In later sections of this essay, I explore how Brenner and Schmid’s theory of ‘planetary urbanization’ and related ideas might inform emergent, post-urban/rural divide planning and development paradigms. For this discussion, I also draw from theories of urban sustainability and urban resilience. However, first, I present a history of city planning and development in the U.S., focusing on the role of urban/rural constructs. I conclude the essay with remarks about how current conceptualizations of urbanization might inform new planning and development approaches that recognize contemporary socio-ecological challenges and adopt a more dynamic view of cities.

Before the Urban Age: Industrial Urbanization and the “Back to Nature” Movement

Industrialization prompted the first great wave of American urbanization in the late 1800s. As people migrated to urban centers for factory work, cities became increasingly congested, polluted, and crime-ridden (Jackson 1985; Hall 1998). While these cities were celebrated as modern arenas of prosperity and representations of progress, industrial urban growth also provoked a reactionary nostalgia for supposed virtuous, clean country living, particularly among elites (Boyer 1983; Jackson 1985). Early planners in the U.S., drawing on the ideas of European theorists, accordingly sought to design new settlements that would bring city dwellers “back to nature” by combining the social and ecological virtues of country living with the economic promise of industrial urbanism (Boyer 1983).

Ebenezer Howard’s ‘garden city’ design, first published in 1898, promised to integrate the best elements of ‘town’ and ‘country.’ Howard envisioned a polycentric agglomeration of small cities with fixed population and area, surrounded by greenbelts supporting agricultural and industrial activities and connected by modern transit systems (Hall 1998). Rexford Tugwell’s ‘greenbelt cities’ initiative, part of President Franklin Delano Roosevelt’s Resettlement Administration New Deal program, drew heavily from this vision. Tugwell, specifically, proposed that the government buy inexpensive land at the periphery of cities to relocate the urban poor. Inner-city areas that formerly housed impoverished communities were to be rebuilt as parks (Hall 1998). While these projects were not ultimately implemented, planning initiatives with inter-related economic, social, and environmental goals continued to gain momentum with support from the Regional Planning Association of America (RPAA), and its champion, Lewis Mumford. Mumford and the RPAA demanded conservation of “human values,” including community, liberty, happiness, and reliable access to services “hand in hand with natural resources” (Hall 1998, 153).

Critically examining the “back to nature” movement reveals that ‘nature’ has always represented a human construct in the American psyche. It should not come as a surprise, then, that genuine interest in ecological concerns is not evident in urban forms preceding the twentieth century ‘urban age,’ as natural and rural areas were designed to serve cities.

Cronon (1996) argued that people’s physical and social construction of ‘nature’ gives rise to “the trouble with wilderness.” The trouble being that by conceptualizing and designing wilderness as apart from human settlements, we abdicate responsibility for environments and ecosystems that sustain human life. He claimed that we require a new conceptualization of nature, so that in pursuing the goals of environmentalism people do not seek to get “back to the wrong nature,” or strive to recreate conditions of a removed, nonhuman wilderness that likely never existed (Cronon 1996). Instead, he called on readers to “embrace the full continuum of a natural landscape that is also cultural, in which the city, the suburb, the pastoral, and the wild each has its proper

place, which we permit ourselves to celebrate without needlessly denigrating the others” (Cronon 1996, 24).

Cronon’s proposition that we consider land, presently settled by humans or otherwise, on a “continuum of a natural landscape” stands in contrast to traditional dualisms, like urban/rural, used to plan and define American urban development patterns and sets the stage for a paradigm shift in planning and development thinking. An urban development model based on a natural continuum, rather than on categories of human-nature interaction or lack thereof, would not allow us to decouple human and natural systems in theory or practice. The remainder of this essay is devoted to exploring how modern theories of urbanization might help clarify a post-urban/rural divide planning paradigm based on this premise.

Planning in the Urban Age

Cities worldwide are confronting complex problems and great uncertainty in the face of global ecological concerns, including climate change and environmental degradation. These ecological problems both motivate and respond to social and economic challenges of urbanization, including growing unemployment, inequality, and violence, among others (Spaans and Waterhout 2017). It is clear that in practice cities operate as systems, driven by interrelated underlying processes that are often agnostic to political boundaries or landscape designations, like urban/rural.

Planning in the urban age demands a more holistic vision of the city and requires that we reconceptualize which (and, ultimately, whether) boundaries are useful for designing and managing places as well as addressing urban problems. I subsequently explore two paradigms that might inform the goals and methods of emergent planning, respectively: urban sustainability and urban resilience, and planetary urbanization.

Urban Sustainability and Urban Resilience

The concept of urban sustainability has garnered significant attention since publication of the United Nations’ *Our Common Future* in 1987, in which “sustainable development” was put forth as the guiding principle for “a global agenda for change” (WCED 1987). Notably, Cronon (1996) mentioned the notion, writing that a reconceptualization of wilderness and people’s relationship with nature “means looking at the part of nature we intend to turn toward our own ends and asking whether we can use it again and again and again—sustainably—without its being diminished in the process” (25). Cronon’s perspective on what constitutes sustainable (re)use is generally echoed by other authors that have written about this concept. Sustainability has been applied to urban planning and development in order to understand how and whether modern cities can grow in a manner that meets three major goals: environmental protection,

social and intergenerational equity, and economic development (Conroy and Berke 2004).

Foley et al. (2005) explored how land use, including land settlement and management, affects urban sustainability. The authors found that more intensive and extensive land use, resulting from contemporary urbanization, has engendered wide-ranging and troublesome effects on the health of natural and human systems. Some effects include a diminished capacity of ecosystems to sustain food production, maintain freshwater and forest resources, regulate climate and air quality, and mitigate the emergence and transmission of infectious diseases. The authors concluded, “Modern land-use practices, while increasing the short-term supplies of material goods, may undermine many ecosystem services in the long run, even on regional and global scales” (572). They argue that modifying these practices to mitigate their deleterious effects requires considering the trade-off between immediate, local social and economic benefits and long-term global decline in human welfare. After outlining a number of specific approaches for managing landscapes in a manner that balances these concerns, the authors generalize: “Many of these strategies involve management of landscape structure through the strategic placement of managed and natural ecosystems, so the services of natural ecosystems . . . are available across the landscape mosaic” (573).

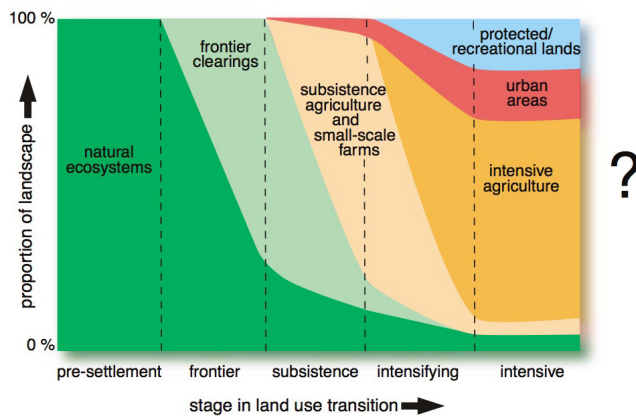


Figure 1 Land use transitions that urbanizing areas may experience over time (Foley et al. 2005).

Recognizing landscapes as existing in a “mosaic,” as parts of an interconnected whole, represents a way of potentially operationalizing Cronon’s theory of situating human settlements along a “continuum of a natural landscape.” Foley et al. (2005) further acknowledged that local ecological challenges will change as landscapes and land uses transition alongside demographic and economic shifts, and that there is uncertainty in how landscapes will evolve as urbanization demands even more intensive and extensive land use (refer to Figure 1). This suggests that contemporary land use plan-

ning frameworks need not only consider how underlying socio-ecological structures connect landscapes, but also how socio-ecological processes change landscapes over time.

Urban resilience has emerged as a framework for theorizing about the ability of cities to respond to such changes, among other stresses and disruptions (Romero-Lankao et al. 2016). Resilience has become increasingly popular in recent discourses and literature about planning and urban development, particularly in the arena of disaster preparedness (refer to Fainstein 2015). Some have argued that ambiguity and overlap in the definitions of sustainability and resilience weaken these concepts (Romero-Lankao et al. 2016; Zhang and Li 2018). Thus, clarification of both urban resilience and urban sustainability is required for effectively conceptualizing and operationalizing these planning and development frameworks.

Zhang and Li (2018) reviewed a large sample of articles on these concepts and found that urban sustainability and urban resilience differ in both their theoretical basis and empirical work. These authors concluded that while resilience and sustainability are certainly, and importantly, related concepts, urban resilience differs from urban sustainability. Specifically, they define urban resilience as “the passive process of monitoring, facilitating, maintaining and recovering a virtual cycle between ecosystem services and human wellbeing through concerted effort under external influencing factors” (145). On the other hand, “Urban sustainability is the active process of synergistic integration and co-evolution between the subsystems making up a city without compromising the possibilities for development of surrounding areas and contributing by this means towards reducing the harmful effects of development on the biosphere” (Ibid.). It seems that these authors recognize resilience as a process that aims to ensure cities can maintain and protect vital socio-ecological systems, even if these systems are perturbed. In contrast, urban sustainability requires acting to ensure development does not disturb socio-ecological systems in a manner that compromises the ability of these systems to support future development.

Wilkinson (2012) argued that socio-ecological resilience has much to offer planning theory and practice in contemporary contexts of ecological crisis. She and coauthors further contested that resilience holds greater promise as a framing concept for ecologically-minded planning than does sustainability; for it is easier to communicate about resilience with urban stakeholders in terms of localized risk (Wilkinson, Porter, and Colding 2010).

The theoretical value of both urban sustainability and urban resilience ultimately lies in their direct confrontation with ecological issues. These frameworks situate ecological objectives at the center of decision-making about urban development. This represents a divergence from past paradigms that removed human systems from natural systems, and suggests new possibilities for more holistic planning and development practices.

Planetary Urbanization

The act of urban planning requires identifying an appropriate analytical unit for which to plan. As scholars have grappled with understanding cities in the age of contemporary urbanization, they have, accordingly, come to question whether modern urban processes require new conceptualizations of the appropriate units of analysis for urban planning. Brenner and Schmid (2014) primarily contest the idea of the ‘urban age’ from a methodological perspective, arguing that what is ‘urban’ cannot be accurately measured. This is attributed, in a physical sense, to rapid population growth and migration that have not been properly documented, and, in a theoretical sense, to the fact that the historical act of organizing territories locally does not adequately consider the contemporary influence of global forces (Brenner and Schmid 2014).

Brenner and Schmid’s theory of planetary urbanization offers a reconceptualization of the urban condition that renders “settlement-based understandings” of urban landscapes obsolete (Brenner and Schmid 2014, 750). These authors echo earlier ideas presented by critical urban theorists who argued that a ‘worlding’ of cities, in which social, economic, and environmental structures and processes are increasingly connected on a global scale, has disrupted the conventional notion of a localized place (Brenner 2000; Robinson 2011; Soja 2010; Roy 2009). Roy (2009) argued that this change is apparent in a “fading of the city into the countryside, in the frontiers that trail into the horizon, and in the vast blotches of sprawl that defy census boundaries and categories” (820). She called for new analytical frameworks for defining and studying contemporary cities that reject “standard geographies of core and periphery” (828), and instead, characterize places using “‘process’ rather than ‘trait’ geographies” (821).

These authors, and others, have also suggested that emerging theories of planetary urbanization require new methods for studying and planning cities that rely on a process-based approach for designating boundaries (Roy 2009; Soja 2010; Satterthwaite 2010; Robinson 2011; Angelo and Wachsmuth 2014). This approach may reflect a more dynamic conceptualization of the city, but is methodologically complex. Some critique the value of planetary urbanism for this reason, arguing that the framework ignores the pragmatic need to identify and manage discrete, localized urban areas as empirical objects with distinct characteristics, including specialized land uses (Walker 2015; Scott and Storper 2015).

In the concluding remarks that follow, I discuss the value of using planetary urbanization to inform contemporary theories and practices of city planning, among other conceptual frameworks discussed in the previous sections, including urban sustainability and urban resilience.

Concluding Remarks: Planning Beyond the Urban Age

In this essay, I have reviewed how theoretical and practical frameworks for urban planning and development have evolved since the nineteenth century. I have traced the use

and importance of designation between ‘urban’ and ‘rural’ settled lands within these frameworks in the U.S., and questioned the role of this distinction, and conventional settlement boundaries more generally, in contemporary contexts. I have argued that modern urbanization, or transition into the ‘urban age,’ demands new frameworks for thinking about planning and developing land that abandon the urban/rural divide; for as human land use becomes more extensive and intensive we increasingly contribute to global ecological concerns like climate change and environmental degradation. It is widely recognized that human systems cannot be decoupled from natural systems, and thus, human settlements should not be considered apart from nature or wilderness. In light of global ecological challenges, people have more responsibility than ever to maintain high quality environments along with high quality of life in cities (Cronon 1996; McKinney, Ingo, and Kendal 2018).

With these goals in mind, we require new conceptual frameworks for thinking about planning and development in the U.S. and globally as urbanization accelerates worldwide. To inform these frameworks, I reviewed how concepts of urban sustainability and urban resilience might guide goal setting for more ecologically conscious planning and development. Urban sustainability promotes a development approach centered on efficient resource use, and aims to ensure present land use and consumption patterns do not diminish the capacity of the environment in a manner that disadvantages others in the present or future (Banister 1996). While urban sustainability provides a conceptual framework for actively setting holistic, socio-ecological planning and development goals in theory, in practice sustainability has proven difficult to clarify or measure. Sustainable urban development, thus, remains a rather elusive undertaking.

Urban resilience takes a more localized and presentist view than urban sustainability, and stresses that we prioritize ensuring the coupled human and natural systems that support cities are strong, and have the ability to recover from stresses and shocks (Romero-Lankao et al. 2016). A resilient city that is pertinacious in the face of ecological uncertainties should be somewhat sustainable, able to at least sustain present conditions for a near- to medium-term future. While urban sustainability represents a more encompassing framework for guiding socio-ecological development, urban resilience may be more easily translated into practice.

Neither urban sustainability nor urban resilience offers particularly clear directions for reconceptualizing physical planning or land use designations in a manner that recognizes the dynamism and entanglement of human-nature interactions. These frameworks are nevertheless useful for theorizing about a planning paradigm for cities that directly addresses global environmental concerns in development practice and prioritizes contemporary socio-ecological goals (Wilkinson 2012).

As the acts of planning and development require both setting goals and taking action to shape and manage human settlements, contemporary frameworks that reconceptualize the urban may inform the appropriate units of analysis for identifying and

solving urban problems. Planetary urbanization, a theory that reconceptualizes the urban condition and stresses process-based understandings of space rather than geographic trait- or boundary-based understandings, offers some perspective for thinking about planning interconnected places along more continuous dimensions. This framework rejects past categories, like 'urban' and 'rural,' used to identify and characterize the urban and processes of urbanization.

A common and important critique of planetary urbanization is that theorists who explicate the framework have not proposed specific new methods for analyzing and managing urban places and responding to urban problems. These critiques are salient insofar as a lack of methodological direction hinders planetary urbanization from translating into practice. Planetary urbanization, thus, presents comparable shortcomings to the urban sustainability framework in lacking clarified means for practical application.

While conventional approaches to understanding and planning cities are debated in theory, these approaches persist in practice. Traditional designations of urban areas and units of analyses therein, like specific land uses, remain useful because they are easily understood by most people. Accordingly, I argue that we require more accessible and inclusive means for thinking about and planning contemporary human settlements in a way that confronts global ecological challenges, and the inevitability (and uncertainty) of change in urbanizing cities. This might require incorporating more community-based, local understandings of place and priorities into land use planning (Glover, Stewart, and Gladdys 2008). In this way, contemporary planners might orient their actions towards achieving greater socio-ecological goals, such as those put forth in the urban sustainability and urban resilience frameworks, while remaining attuned to local needs and responsive to changing conditions.

Ultimately, a planning paradigm that transcends the urban/rural divide requires that theorists and practitioners push their own boundaries, and consider how we can, as Cronon suggested, celebrate the contemporary urbanizing city without denigrating the myriad of landscapes that support it. This framework demands that we remain flexible to recognizing and managing changing landscapes, and accordingly, reconceptualize effective boundaries for planning and development. Furthermore, it necessitates that we prioritize environmental quality as we do quality of life, for the condition of the city and that of nature are one in the same.

References

- Angelo, Hillary, and David Wachsmuth. 2014. "Urbanizing Urban Political Ecology: A Critique of Methodological Cityism: Urbanizing Urban Political Ecology." *International Journal of Urban and Regional Research*, March, 1-14. <https://doi.org/10.1111/1468-2427.12105>.
- Banister, David. 1996. "Barriers to Implementation of Urban Sustainability." In *European Regional Science Association*, 20. ETH Zurich, Switzerland.

- Boyer, Christine. 1983. "In Search of a Spatial Order." In *Dreaming the Rational City: The Myth of American City Planning*, 1987th ed., 33–56.
- Brenner, Neil. 2000. "The Urban Question: Reflections on Henri Lefebvre, Urban Theory and the Politics of Scale." *International Journal of Urban and Regional Research* 24 (2): 361–378.
- Brenner, Neil, and Christian Schmid. 2014. "The 'Urban Age' in Question: The 'Urban Age' in Question." *International Journal of Urban and Regional Research* 38 (3): 731–55. <https://doi.org/10.1111/1468-2427.12115>.
- Conroy, Maria Manta, and Philip R Berke. 2004. "What Makes a Good Sustainable Development Plan? An Analysis of Factors That Influence Principles of Sustainable Development." *Environment and Planning A: Economy and Space* 36 (8): 1381–96. <https://doi.org/10.1068/a367>.
- Cronon, William. 1996. "The Trouble with Wilderness: Or, Getting Back to the Wrong Nature." *Environmental History* 1 (1): 7. <https://doi.org/10.2307/3985059>.
- Ellis, Erle C. 2016. "Ecology in an Anthropogenic Biosphere." *Ecological Monographs*, 287–331. [https://doi.org/10.1890/14-2274.1@10.1002/\(ISSN\)1557-7015](https://doi.org/10.1890/14-2274.1@10.1002/(ISSN)1557-7015). *Monographs Centennial Papers*.
- Fainstein, Susan. 2015. "Resilience and Justice." *International Journal of Urban and Regional Research* 39 (1): 157–67. <https://doi.org/10.1111/1468-2427.12186>.
- Foley, Jonathan A., Ruth DeFries, Gregory P. Asner, Carol Barford, Gordon Bonan, Stephen R. Carpenter, F. Stuart Chapin, et al. 2005. "Global Consequences of Land Use." *Science* 309 (5734): 570–74. <https://doi.org/10.1126/science.1111772>.
- Glover, Troy D., William P. Stewart, and Katerie Gladdys. 2008. "Social Ethics of Landscape Change: Toward Community-Based Land-Use Planning." *Qualitative Inquiry* 14 (3): 384–401. <https://doi.org/10.1177/1077800407309409>.
- Hall, Peter. 1998. *Cities of Tomorrow: An Intellectual History of Urban Planning and Design Since 1880*. 1996 edition. Oxford, UK; New York, NY, USA: Blackwell.
- Jackson, Kenneth T. 1985. *Crabgrass Frontier: The Suburbanization of the United States*. New York, NY, USA: Oxford University Press, Inc.
- McIntyre, Nancy E., Kimberly Knowles-Yáñez, and Diane Hope. 2000. "Urban Ecology as an Interdisciplinary Field: Differences in the Use of 'Urban' between the Social and Natural Sciences." *Urban Ecosystems* 4 (1): 5–24.
- McKinney, Michael L., Kowarik Ingo, and Dave Kendal. 2018. "The Contribution of Wild Urban Ecosystems to Liveable Cities." *Urban Forestry & Urban Greening* 29 (January): 334–35. <https://doi.org/10.1016/j.ufug.2017.09.004>.
- Robinson, Jennifer. 2011. "Cities in a World of Cities: The Comparative Gesture: Cities in a World of Cities Compared." *International Journal of Urban and Regional Research* 35 (1): 1–23. <https://doi.org/10.1111/j.1468-2427.2010.00982.x>.
- Romero-Lankao, Patricia, Daniel M. Gnatz, Olga Wilhelmi, and Mary Hayden. 2016. "Urban Sustainability and Resilience: From Theory to Practice." *Sustainability* 8 (12): 1224. <https://doi.org/10.3390/su8121224>.
- Roy, Ananya. 2009. "The 21st-Century Metropolis: New Geographies of Theory." *Regional Studies* 43 (6): 819–30. <https://doi.org/10.1080/00343400701809665>.

- Satterthwaite, David. 2010. *Urban Myths and the Mis-Use of Data That Underpin Them*. Helsinki: WIDER. <http://hdl.handle.net/10419/54031>.
- Scott, Allen J., and Michael Storper. 2015. "The Nature of Cities: The Scope and Limits of Urban Theory." *International Journal of Urban and Regional Research* 39 (1): 1–15. <https://doi.org/10.1111/1468-2427.12134>.
- Soja, Edward. 2010. "Regional Urbanization and the End of the Metropolis Era." In *The New Blackwell Companion to the City*, 679–89. Blackwell.
- Spaans, Marjolein, and Bas Waterhout. 2017. "Building up Resilience in Cities Worldwide – Rotterdam as Participant in the 100 Resilient Cities Programme." *Cities* 61 (January): 109–16. <https://doi.org/10.1016/j.cities.2016.05.011>.
- Walker, Richard. 2015. "Building a Better Theory of the Urban: A Response to 'Towards a New Epistemology of the Urban?'" *City* 19 (2–3): 183–91. <https://doi.org/10.1080/13604813.2015.1024073>.
- WCED. 1987. *Our Common Future*. 1 edition. Oxford ; New York: Oxford University Press, U.S.A.
- Wilkinson, Cathy. 2012. "Social-Ecological Resilience: Insights and Issues for Planning Theory." *Planning Theory* 11 (2): 148–69. <https://doi.org/10.1177/1473095211426274>.
- Wilkinson, Cathy, Libby Porter, and Johan Colding. 2010. "Metropolitan Planning and Resilience Thinking: A Practitioner's Perspective," 12.
- "World Urbanization Prospects: The 2018 Revision." 2019. ST/ESA/SER.A/420. New York: United Nations: United Nations, Department of Economic and Social Affairs, Population Division.
- Zhang, Xiaoling, and Huan Li. 2018. "Urban Resilience and Urban Sustainability: What We Know and What Do Not Know?" *Cities* 72 (February): 141–48. <https://doi.org/10.1016/j.cities.2017.08.009>.

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Transformative Practices within Mechanisms of Control: “Recognizing” Unrecognized Arab-Bedouin Villages in Israel

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Abstract

“Seeing from the South” (Watson 2008) and “Re-engaging Planning Theory with South-Eastern Perspectives” (Yiftachel 2006) are essential calls for the development of planning theories and empirical research from the Global South. Such scholarship has interpreted the rationalities at play as informal settlements develop on the peripheries of rapidly globalizing cities and explored how they reflect the nature of state interventions. This article examines the utility of planning theories issued from the Global South and North in explaining a case of state planning for an indigenous, ethnic minority in Israel: the Negev/Naqab Arab-Bedouins. The researchers conducted 90 interviews with planners, engineers, Bedouin residents, government officials, academics, and employees of non-governmental organizations. Their aim was to understand how stakeholders comprehended, engaged with, and approached planning for the Abu-Basma Regional Council, a state initiative to plan and provide services to informal Bedouin villages in Israel’s south, as well as the program’s outcomes. The findings indicate that planning theories from the Global South, which are focused on space, resource distribution, and resident-driven spatial change, are essential to understanding the outcomes of planning. They provide a necessary context for the North’s normative/prescriptive planning theories, which highlight tangible “episodes” (Healey 2007, 78) of planning practice but risk misattributing popular resistance to a program’s communication challenges, rather than to residents’ fundamental objections.

Keywords: Participatory planning, Bedouin, Territorial control, Indigenous, Global South

Introduction

Planners working within restrictive political systems and in the Global South have indicated the irrelevance and, at its worse, harm of prevailing planning theories to their circumstances (Lo Piccolo 2008). Proceduralist planning theories issued out of the Global North have promoted methods such as “instrumental rationality” that follow “technical rules” (Thomas 1979, 72), which in promoting neutrality and universal applicability erased the legacies of historic injustices and overlooked differences. “Rational/procedural planning” catalysed assimilationist solutions to housing and employing indigenous peoples in settler states, such as the United States and Australia, by addressing the most visible expression of colonialism: poverty. Rather than correct for the forced displacement of indigenous communities from their lands and natural resources, these measures sought to urbanize indigenous peoples and provide oppor-

tunities for employment in the name of “universal citizenship” (Walker and Barcham 2010, 315; Jackson 1997).

Efforts to implement the Global North’s collaborative/communicative planning on rapidly developing cities in the Global South risk upsetting existing physical and social infrastructures. These infrastructures may not reflect democratic values or progressive ideals, but they enable communities, such as ethnic groups, to maintain networks and settlements which enable their survival (Watson 2002). Collaborative planners’ attempts at dialog may be “affirming,” but are outpaced by globalization and out-influenced by foreign capital and institutions (Harrison 2006, 329). Moreover, the regressive side of plan implementation, including forced resettlement, has not been told through case studies that evaluate participatory mechanisms (Yiftachel 1998, 2006).

In response, practitioners and scholars working in the Global South have illuminated the material impacts of urban policy on people and spaces by assessing the structural, historic, and contextual circumstances of planning programs (Roy 2009). Case studies have examined informal ways of operating and regressive planning outcomes, while giving voice to the individuals, contexts and processes ignored by planning scholarship and marginalized by the political or economic elite (Kamete 2009; Yiftachel 2008). “Theorizing from the South-East” (Yiftachel 2006, 216) and fostering “a view from the global South” (Watson 2009, 2261) are efforts to explain and understand planning in a way that prevailing planning theories have been unable to.

This scholarship seems to be influencing theory in the North as well. Major journals such as *Planning Theory & Practice* have called for “papers and research that not only inform practice, but challenge practice and open new frontiers or alternatives for theory and practice” (Scott 2019, 4). Planning theory is tasked with addressing the diversity of actors, contexts, processes, and outcomes which characterize the discipline, particularly in the Global South. Scholars advancing planning theory’s “Southern turn” (Satgé and Watson 2018, 1) have made important strides in reorienting scholars away from consensus and towards conflict and, in doing so, have tasked practitioners and academics with understanding the “conflict of rationalities” between state and non-state actors and how they play out over space (Watson 2009, 2267; Satgé and Watson 2018).

Nonetheless, the “cutting edge” of alternative planning in the Global South has come from the grassroots, rather than from academia or practitioners (Porter 2011, 479). There is much to do, including a “taking-to-task for our collective negligence of the political in our own domain” (Porter 2011, 479). A Johannesburg planner, Harrison (2014, 48) celebrates the “more direct engagement with ‘urban realities,’” but laments that in “distancing itself from ‘theories of the North’ . . . [planning theory from the South] now seems inappropriate for wrestling with the problems at hand”.

At such an important juncture we ask: How useful is planning theory to understanding practice in the Global South? We address this question by taking as a case the

Abu-Basma Regional Council (ABRC), a planning initiative undertaken by the State of Israel to formalize indigenous Arab-Bedouin villages in Israel's Negev/Naqab Desert.

Government Planning for the Bedouin in Israel

Bedouins receive their name for their traditional lifestyle as peoples of the desert, or *badia* in Arabic. Bedouins living in Israel migrated north from the Arabian Peninsula between the fifth and 20th centuries, settling in today's Jordan, Israel, Lebanon, Syria, Sinai, Iraq, and the Palestinian Territories (Marx 1977). Each tribe served as a large political organization, which governed the areas its members traditionally worked in and occupied. Bedouin farmlands and dwellings were divided spatially by tribal sub-units (extended families known as *hamulas*), while pastures and wells were common property of the tribe (Meir 1997). Bedouins were pastoral nomads who were often sedentary during the rainy season, as they grew crops and settled in permanent and temporary dwellings. During the drier months Bedouins grazed herds across a wider territory, known as *dira*, or "area of migration" (Marx 1977, 351).

Settlement through Regional Service Provision and Changing Geopolitical Borders: 1900–1948

Bedouins gradually discontinued their pastoral nomadic lifestyle during the Ottoman Empire (1516–1922) and British Mandate (1922–1948). The construction of regional service centers by the Ottomans and British, such as the Ottoman City of Beer Sheva (1900), and demand for Bedouin agricultural products and labor to support the British war effort (1939–1945) triggered a gradual shift in Bedouin settlement patterns and occupations (Meir 1988; Abu-Rabia 2001). The establishment of the Israeli State in 1948 posed the most significant changes for the Bedouin population of the region. Prior to 1948, 65k Bedouins lived in the Negev/Naqab Desert. The Negev/Naqab is a semi-arid desert that encompasses the southern half of Israel, stretching from the Palestinian Territories in the east to Gaza in the west. By the close of the 1948 War, 80 percent of the Arab population of mandatory Palestine had fled or were removed by Israeli authorities to neighboring states such as Palestine, Jordan, and Egypt. In 1949, 11k of the 65k Bedouins who had lived in the Negev/Naqab remained (Meir 1988).

Regional Concentration and Planned Resettlement: 1949–1991

From 1949 to 1966 an Israeli military order concentrated the remaining Bedouins in the Negev in the *sayig*, an enclosure zone of 1000 km² located east of Beer Sheva (Meir 1997). The *sayig* is outlined with orange dashes in Figure 1. During this time, residents suffered many economic hardships as a result of the limitations set on their access to grazing pastures and agricultural areas (Kressel et al. 1991). Over 100 "spontaneous" localities were developed by the Bedouin in the *sayig* according to traditional land-holdings and family ties (Meir 1998, 261). These settlements lacked basic services with

the exception of the schools and clinics built by British administrators and Bedouins during the Mandate. Today, they exist as 45 “unrecognized villages”; lacking complete legal recognition, these villages are denied, at varying scales, many of the basic services received by Israeli municipalities such as electricity, roads, sewage, and waste removal and are threatened by demolition orders (Yiftachel 2003; Abu-Saad 2008).

In 1966, when the military order was lifted, the government prioritized the state’s development objectives while attempting to meet Bedouins’ immediate needs for housing and services (Shmueli et al. 2011; Dinero 2004). Town planners determined that urban settlements could accommodate a large number of residents over a small area and both expedite and lessen the costs of service provisions (Horner 1982). Between 1966 and 1991, seven urban settlements were planned and built within the *sayig*. Each urban settlement was planned to accommodate 15k–25k people (Dunsky 2009). The localities include one Bedouin city, Rahat, and six other towns: Tel Sheva, Hura, Arara BaNegev, Kseifa, Laqiya, and Segev Shalom. They are marked in dark green in Figure 1.

The urban settlement program has relocated nearly half of Negev Bedouins from unrecognized villages (Dinero 2010). Over 127k Bedouins lived in the urban settlements in 2010, and their population grows each year (Shmueli et al. 2011). Each town has public schools, clinics, and community centers; however, they suffer from inequalities in budgets and resources as compared to Jewish towns (Swirski and Hasson 2006). Residents of unrecognized villages are encouraged to move to the localities through a ‘carrot and stick’ policy (Dinero 2010). The government provides ‘the carrot’ by subsidizing the cost of a residential plot in an urban town and compensating residents for terminating their land-ownership claims and demolishing their homes in unrecognized villages. Simultaneously, the state applies the ‘stick’ through the enforcement of planning regulations, such as the demolition of houses and agricultural fields by the Ministry of the Environment’s Green Patrol with police support (Dinero 2010, 55).

The seven townships have been criticized by Bedouin advocacy organizations and academics for depriving inhabitants of economic opportunities and overlooking Bedouin cultural needs (Lithwick 2000; Meir 2011; Horner 1982). Planners ignored spatial divisions among extended families, historical class differences, and the importance of agriculture to the Bedouin economy, identity and lifestyle. They also did not consider the impact of urbanization on women’s access to space and livelihood, as well as the size a residential plot would need to be to accommodate a large Bedouin family (Abu-Saad 2008; Fenster 1998; Meir 2011). These oversights have hindered the towns’ growth, creating some deficient neighborhoods with partial services (Abu-Saad 2008; Lithwick 2000), crime and health problems (Diamond et al. 2008; Dinero 2010), and, with the exception of Rahat, the six highest unemployment rates in the country (Swirsky and Connor-Atias 2017). Dispossessed of their primary means of capital, the land, many male Bedouins have entered low wage positions in construction, trucking and industry (Abu-Saad and Creamer 2012; Dinero 2004). Women, who were equal contributors to the pastoral

economy, have developed informal, home-based work to supplement their families' low incomes (Abu-Rabia-Queder 2019).

Planning scholarship has interpreted the Bedouin township program as a rational procedural planning failure; by planning for a pastoral nomadic population utilizing traditional methods and tools, the needs of a unique population were inadequately accommodated (Horner 1987; Meir 2005). Abu-Saad (2008) goes further to argue that the urban concentration of Negev Bedouins reflects the “ideological nature of spatial planning in Israel,” in which “dispersion of the Jewish population through the land continued to be one of Israel’s national planning goals” (1730). The urban towns contradict Bedouins’ traditional occupations and settlements because Bedouins’ spatial needs challenge the state’s mission to “Judaize” the Negev (Yiftachel 2003, 21).

The State-Bedouin Landownership Conflict and Grassroots Advocacy: 1966–2020

Relocating Bedouins to the *sayig* enabled the state to expropriate 1000 km² of Negev lands the Bedouin had occupied before 1949. The state claimed these lands through interpretations of land tenure laws adapted from the Ottomans and British, triggering an ongoing land dispute between the Israel Lands Administration (ILA)—the landholding arm of the Israeli government—and the Negev Bedouins (Jiryis 1973). Between the 1970s and early 2000s, Bedouins registered claims to 589k dunams¹ of land in the Negev with the Ministry of Justice’s Land Title Settlement Unit as the historic occupants of the region (Begin 2013). Bedouins with claims to these areas awaited court hearings in the Beer Sheva District Court to determine if they or the ILA were the rightful owners. Out of 200 decisions reached, none were found in favor of a Bedouin claimant (Elsana 2018).

Approximately 58k Bedouins have chosen to remain in their unrecognized villages, citing their need to live in low-density agricultural settlements on their own lands (Shmueli and Khamaisi 2011). Residents of unrecognized villages have objected to an ILA policy that mandates Bedouins to resolve or terminate their landownership claims before they can obtain a compensation package and relocate to the planned townships. Grassroots actions, including weekly protests by Bedouin residents and advocates, the reconstruction of demolished homes, and petitions filed to the Israeli High Court have forced the government to rethink its approach to Bedouin settlement and service provision (Meir 2009; “Unrecognized Villages” 2012; Rudoren 2013).

Residents of unrecognized villages have prepared their localities for recognition by establishing their own regional council, the Regional Council for Unrecognized Villages (RCUV). Through the RCUV, residents developed a master plan that unofficially formalized all unrecognized villages in the Negev (Meir 2005). The RCUV developed local committees in participating villages which functioned as local authorities (Local Committee 2006). Within local committees, planning sub-committees developed basic infrastruc-

1 One dunam is equivalent to .0001 square kilometers, or roughly 0.247 acres.

tures such as roads and water pipes in some villages amid the state's denial of services. Local committees succeeded in organizing residents against regional plans, which would have evicted residents of unrecognized villages and annexed the land to surrounding municipalities. The RCUV demonstrated that residents of unrecognized villages had the capacity for self-governance; however, the organization did not gain recognition by Israeli authorities (Meir 2005; Local Committee 2006).

The Abu-Basma Regional Council: 2003–2012

The Abu-Basma Regional Council² (ABRC) was founded in 2003 by the Israeli Interior Ministry to plan and provide services to initially seven (then 12) Bedouin villages in the Negev (Yahel 2006). ABRC was formed to overcome a “deadlock” between Bedouin and Israeli authorities over fundamental issues including the rejection of Bedouin land-ownership claims by the Israeli courts, as well as the non-recognition of their agricultural villages by the national planning system, the Israel Planning Administration (IPA) (Yiftachel 2003, 21). ABRC was established through the Local Councils Ordinance as part of a seven-year development project for the Negev Bedouins. The council's founding was paired with a 400 million shekel (U.S. \$116,000,000) funding package for planning, economic development, and infrastructure in Bedouin towns (Yahel 2006; Golan 2007). ABRC lists its mission to “improve trust between the Bedouins and the State of Israel . . . improve community participation in decision making, planning and implementation . . . [and] improve municipal services” (ABRC 2010). Following the council's inauguration, residents of unrecognized villages celebrated that “the old stage of fighting for staying on this land ended, and a new stage for building and constructing had begun” (Local Committee 2006).

The first ABRC localities—Molada, Drejat, Cochle, Tarabin al-Sana, Kaser a-Ser, Bir-Hadaj, Abu-Krenat, and Umm Batin—began planning under the Bedouin Administration, a former authority within the ILA, in the late 1990s. These villages have approved master plans and began local planning through ABRC and the Bedouin Authority, a modified version of the Bedouin Administration within the Ministry of Housing. Four more villages—Ramat Tsiporim, Wadi El-Naam, Al-Fura, and Abu-Tlul—also entered the planning process in the 2000s. All but two ABRC localities encompass portions of pre-existing unrecognized villages within their planned areas. Thus, literature issued by ABRC describes the council as planning villages in-situ, “incorporating formerly unrecognized Arab Bedouin townships in the Israeli Negev” (ABRC 2010). In 2009, ABRC planners projected that 109.5k Bedouins would live in the localities by the end of 2015. By 2030, the largest of the localities could have the capacity to house 12k–17k residents, and the smallest 3k–6.5k (Dunsky 2009).

2 Regional councils are Israeli local governments that typically consist of several smaller communities in rural areas. Communities incorporated within regional councils may not have the infrastructure to stand alone as singular localities, known in Israel as local councils.

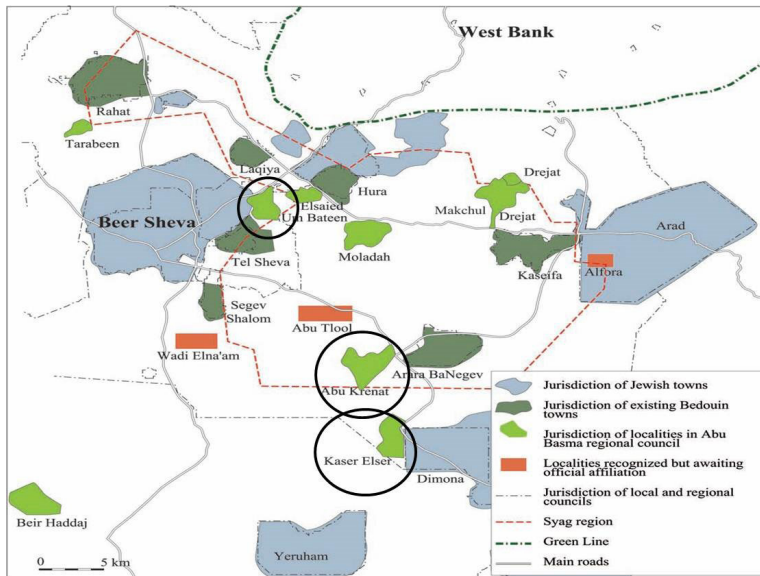


Figure 1 Map of localities in the *sayig*.

Source: Reproduced with permissions from Shmueli and Khamaisi (2011, fig. 2).

Note: Black circles have been added by the authors to indicate ABRC localities selected as study sites.

Regional Planning Addresses Village Recognition: 2005–2013

Regional planning initiatives for Israel's south have set vague parameters for village recognition. TAMA 35, the Integrated National Master Plan for Construction, Development and Preservation (2005) produced the Partial District Outline Plan for the Beer Sheva Metropolitan Area 4/14/23 (filed in 2007 and approved in 2012) that guided land use decisions in the Northern Negev. Plan 4/14/23 approved the relocation of military bases from the rapidly developing center of the country, protected open space, and encouraged the development and revitalization of industrial areas and settlements within the Beer Sheva Metropolitan Area, including Bedouin villages (Shmueli and Khamaisi 2018). It also set forward the goal to “determine the location and rules for planning settlements in a variety of models to arrange Bedouin settlement,” though did not stipulate specific villages to recognize (Planning Administration 2019).

In 2007, the Ministry of Housing's Goldberg Commission for Regulating Bedouin Settlement in the Negev added criteria, stipulating that “recognition be granted, to the best possible extent, to each of the unrecognized villages in which there is a minimum carrying capacity; this, on the absolute condition that such recognition does not contradict a regional master plan” (Begin 2013). Reports out of the Israeli Prime Minister's Office (Praver in 2011 and Begin in 2013) recommended abolishing the hearing system for settling land claims and replacing it, instead, with a set compensation scheme that values land claims based on its location, size, and evidence of cultivation. Although the compensation recommendations were not formalized into law, with few exceptions,

Bedouin land claims are no longer being heard in court. Therefore, as planning and development moves forward, land title settlement remains stagnant (Yahel 2019).

ABRC in the Literature

Literature examining the Abu-Basma Regional Council can be organized into three groups, labeled by the planning theory they most dominantly evoke: (1) collaborative planning (Begin 2013; ABRC 2010; Yahel 2019; Yahel 2006); (2) planning-as-control (Abu-Saad 2014; Abu-Saad 2008; Negev Coexistence Forum 2010; Human Rights Watch 2008); and, (3) pragmatism (Shmueli and Khamaisi 2011, 2015; Arieli 2018; Berman-Kishony 2008; Rudnitzky and Abu-Ras 2012; Meir and Stavi 2011).

Group 1: ABRC was Collaborative Planning

Publications which promote the progressive and collaborative nature of planning ABRC villages have been issued by present and former government employees. Coupled with initiatives to settle Bedouin land claims and build additional housing in the Bedouin townships, the establishment of ABRC is a “turning point” in the state’s approach to settling Bedouins in the Negev (Yahel 2006, 13). Well-attended public meetings, Bedouin committee members, and the inclusion of residents’ input in plans and reports are highlighted as collaborative shifts in state policy (Yahel 2019; Begin 2013). The practical challenges of formalizing unrecognized villages, such as providing services to low-density localities, are illustrated and promote the relocation of Bedouins outside of recognized villages to planned neighborhoods for reasons of human rights and safety (Yahel 2006). These studies highlight special incentives built into Bedouin settlement policies which are not awarded to Jewish Israelis, including access to land in a planned village for free and compensation for relocation expenses and abandoned crops or housing (Yahel 2019). Impediments to the growth of ABRC localities are attributed to inconsistent policy implementation, resident resistance, and a lack of unified local leadership (ABRC 2010; Yahel 2019).

Group 2: ABRC was Planning-as-Control

Studies positing that ABRC advances Bedouins’ dispossession of their traditional lands and exacerbates resource inequality between Arabs and Jews have appeared in academic publications and reports by Israeli and international advocacy organizations. These studies find that ABRC is “too little too late,” as the state’s efforts to engage Bedouins in planning unrecognized villages follow 50 years of forced resettlement. This legacy has seeded deep mistrust between Bedouins and the Israeli authorities, and therefore overshadows government efforts to formalize a small minority of the 45 unrecognized villages. Many of the policies utilized to fulfill the township program have also been maintained for ABRC localities, such as the requirement that Bedouins terminate land ownership claims to obtain residential land, and the use of the Green Patrol to enforce resettlement through housing demolition (Abu-Saad and Creamer

2012; Negev Coexistence Forum 2010). This suggests that the ABRC program retains similar goals.

The studies also highlight ABRC's population density, the highest in the country. Unlike Jewish regional councils, ABRC's jurisdiction does not include the areas between its localities- only the planned areas of the localities themselves (Human Rights Watch 2008). Such an outcome suggests a state intention to limit the expansion of Bedouin towns and deprive the Council of essential tax revenues (Abu-Saad 2008; Swirski and Hasson 2006). A lack of Bedouin representation in ABRC leadership—the mayor, for example, who was appointed by the Interior Ministry, is Jewish—and the suspension of ABRC's municipal elections in 2008, are identified as additional indicators that the program is “control-oriented,” as it is designed to stifle self-governance (Abu-Saad 2014, 148; Abu-Saad 2008).

Group 3: ABRC Viewed through Pragmatism

Between these poles exists recent research which suggests that ABRC marks a change in approach by planning unrecognized villages on-site and consulting with Bedouin representatives. At the same time, these studies find problems with the incomplete recognition of Bedouin lands within the Council's municipal borders (Meir and Stavi 2011) and persisting inequalities in the provision of basic services, including schools, to ABRC villages (Rudnitzky and Abu-Ras 2012). Some studies acknowledge internal barriers to development within ABRC localities, such as residents' rejection of Sub-District Plan 14/4/23, and their opposition to the costs associated with building homes legally, including paying taxes, hiring an architect, and obtaining a building permit (Shmueli and Khamaisi 2015; Shmueli and Khamaisi 2011).

Ultimately, this body of research warns against further polarization by Bedouin residents and government actors, urging “pragmatic compromises” that do not allow the conflict over Bedouin lands to preclude the potential investments in infrastructure, housing, and the economy introduced by state recognition (Arieli 2018, 101). Such compromises could be the results of new planning possibilities determined by stakeholders on a village by village basis. Negotiations, rather than enforcement “from above,” will according to these researchers help develop long-term planning solutions in line with larger-scale state recommendations that more Bedouin residents will buy into (Shmueli and Khamaisi 2011; Berman-Kishony 2008).

In-situ recognition through noncontiguous regional governments appears to be the state's chosen path forward. In 2012, ABRC was split into two regional councils, Neve Midbar Regional Council and Al-Qasum Regional Council. Neve Midbar governs four localities: Kaser a-Ser, Abu-Tlul, Abu-Krenat, and Bir Hadaj (Neve Midbar Regional Council 2017). Al-Qasum governs seven: Umm Batin, El Sayyid, Drejat, Cochle, Molada, Machol, and Tarabin a-Sana (Al-Kasum Regional Council 2018). These municipalities,

like ABRC, exclusively encompass lands within the “blue lines”³ of each recognized village and retain the same responsibilities for planning and service provision. The ABRC model therefore merits further study utilizing planning theory to understand the processes and impacts of the program and to anticipate what the future of Bedouin settlement holds.

Methodology

This article is the outcome of a master’s thesis entitled “Navigating the Path from Planning Paradigm to Plan Implementation: The Case of a New Bedouin Locality in Israel” at the Albert Katz International School for Desert Studies of Ben-Gurion University of the Negev. Initially, the thesis sought to understand the ideologies guiding the work of housing planners in the northern Negev. The chosen case, ABRC, quickly suggested that following planners around, asking them questions, and studying plans would not tell the entire story, particularly one so embedded in history and driven by bottom-up action. The researchers therefore sought to illuminate both the processes and outcomes of planning ABRC localities—and to what degree they reflect state and Bedouin goals—by selecting three Bedouin villages included within the Abu-Basma Regional Council as study sites. These villages are Abu-Krenat, a small, rural agricultural village of 2700 residents; Umm Batin, a suburban village of 4500 residents east of Beer Sheva; and, Kaser a-Ser, an agricultural village of 3500 residents located west of the city of Dimona.⁴ These sites are circled in Figure 1. They were selected because the state-driven planning process had been initiated around the same time, and local plans for service centers were being implemented by ABRC engineers. At the time of study, new plans for neighborhoods and additional service centers were being developed for the localities by government-hired planners. Therefore, the cases were comparable and provided ample data for the researchers to study both the process and outcomes of government planning.

We employed qualitative research methods at different sites where stakeholders went about their daily routines, including workplaces, neighborhoods, committee meetings, and public demonstrations. Our goal was to develop an understanding of respondents’ various roles in the planning process, their ideas of desired planning outcomes, and the impacts of planning as they were experienced. Methods included semi-structured interviews and participant observation.⁵ Stakeholder groups, with participant numbers in parentheses, were: government (19), residents (50), planners (8), academics (4), and advo-

3 “Blue lines” are the municipal boundaries of a recognized locality that set the limits to the locality’s planned area.

4 Population numbers are estimates provided by either the village *sheikh* or head of the local committee, as government census data does not accurately reflect the number of residents.

5 12 participant observation episodes were conducted at different sites where stakeholders met, worked, and lived. These visits shed light on the dynamics of interpersonal interactions between and within groups, the cultures governing different spaces, and each stakeholder’s interactions within space.

cacy (7). Respondents from the government group included Bedouin representatives on village committees (8), ABRC employees (7), and Southern District planning officials (4). Altogether, 90 interviews were conducted between 2010 and 2012. Interviews ranged from brief discussions while “hanging around” (Morito 2005, 7) at local places to scheduled interviews lasting approximately 90 minutes. Participant observation occurred in forums such as the Local Committee for Planning and Building, political demonstrations, and site visits with ABRC engineers. The researchers also evaluated master plans, neighborhood plans, and plans for service centers assembled by planners hired by ABRC, the Bedouin Administration, the Bedouin Authority, and residents during the plan approval process and plan implementation.

Due to the sensitive nature of planning for/with Bedouins, extra care was taken by the interviewer and her translators to respect cultural norms and confidentiality during fieldwork, particularly in Bedouin villages and government offices. The researchers were careful to approach “gatekeepers” and secure their approval before conducting interviews or participant observations in sensitive arenas. Whenever possible, interviews were conducted in the respondent’s preferred language through a translator of the same gender in the respondent’s chosen setting. These accommodations sought to provide a secure and comfortable environment for respondents.

Results

Planners' Approach: Balancing Cultural Needs and Legal Restrictions

The term “planner” applies to a diversity of individuals who were active in planning ABRC localities. “Planners” had different clients, practices, motivations, affiliations, and areas of work. To clarify the planners discussed in this article, each has been assigned a title specific to their responsibilities and affiliations. These appear in Table 1. While these categories have been developed based on planners’ titles and associations, the authors recognize that such distinctions are not so simple; planners might have traded tasks, ideas, and allegiances at different times during the process.

Planners expressed that they were charting “a new approach to settling the Bedouin” by planning ABRC localities (Planner of Abu-Krenat 2011). ABRC exemplified “a big change in attitude . . . to look, as well as it’s possible, to the existing situation, to the existing structures, to the land claims and to the population itself” (Planner of Abu-Krenat 2011). Methods included empowering local leadership, devising culturally sensitive mechanisms for public consultation, negotiating when conflicting needs arose, and ratifying existing land uses in plans. These mechanisms were highlighted by interviews with planners, ABRC employees, some residents, and local committee members. Challenges to these approaches arose as well, including evidence that the public consultation process had not reached residents with less political or financial capital and that geographic limitations set on local plans by earlier government decisions, including Sub-District Plan 4/14/23, inhibited the realization of residents’ goals and triggered their

opposition. Here, this “new approach” will be explored from the perspectives of all stakeholders to illuminate planning mechanisms and how they worked in practice.

| Name in article | Affiliations | Actual positions | Responsibilities |
|--------------------------|--|--|--|
| Government-hired planner | <ul style="list-style-type: none"> The Abu-Basma Regional Council The Bedouin Authority | <ul style="list-style-type: none"> Engineers and certified planners who are employees of the Abu-Basma Regional Council Independent planners contracted to plan a master plan, neighborhood, or service center for an Abu-Basma locality | <ul style="list-style-type: none"> Plan balancing legal requirements and “modern” planning tools with the expressed needs of Bedouin residents Engage a “representative sample” of residents in undistorted public consultations |
| Social consultant | <ul style="list-style-type: none"> Ben-Gurion University Haifa University | <ul style="list-style-type: none"> “Experts in Bedouin culture” who were familiar to residents, and hired by planners to perform public consultations in Abu-Basma villages | <ul style="list-style-type: none"> Introduce basic planning concepts to residents Meet with local committees Conduct household surveys Use familiarity with local residents to build trust between residents and government-hired planners |
| District planner | Southern District Planning Office, Israel Planning Administration (IPA) | <ul style="list-style-type: none"> Certified planners who worked for the Southern District or IPA’s national office Independent planners and academics asked to serve on ministerial planning committees Independent planners contracted for district planning work | <ul style="list-style-type: none"> Convene and/or participate in ministerial planning committees to determine large-scale planning answers for the Southern District, (e.g., the recognition of unrecognized Bedouin villages) Plan or participate in planning District Outline Plans (DOPs), which dictated land uses, and suggested new Israeli municipalities |
| Alternative planner | <ul style="list-style-type: none"> Regional Council for Unrecognized Villages (RCUV) Bimkom Independent planners hired by residents | <ul style="list-style-type: none"> Academics and certified planners who were Bedouin and/or were affiliated with planning advocacy organizations | <ul style="list-style-type: none"> Conduct planning processes in unrecognized villages, outside of the legal planning apparatus Re-plan areas which had been planned by the government that did not represent residents’ needs |

Table 1 The titles, affiliations, and areas of work of planners in this article.

Source: Researchers’ survey, 2012.

Note: Table comprises the authors’ aggregated interview data, which produced four general groups of professionals engaged in planning.

Resident Participation through Local Committees

When initiating public participation, social consultants—described in Table 1—organized preliminary meetings with village “gatekeepers,” primarily sheikhs or male relatives of sheikhs (Social Consultant 2010). Social consultants’ intentions were to build trust, introduce the planning process, and develop a means of communicating with

the rest of the village. These meetings confirmed that consultation with the RCUV's local committees would respect the existing power structures and cultural practices in the village, adhere to Israeli laws for democratic local governance, and reach residents quickly in a language they could understand. Local committees were therefore utilized by planners as the primary mechanism for public involvement in planning (Social Consultant 2010; Director of Statutory Planning for ABRC 2011).

Local committees were structured to transfer the power once held autonomously by the *sheikh* to a committee comprised of men from every family in the village. Each family was expected to elect one or two members to the committee and a village-wide election was held to elect one head of the local committee. Once identified, local committees were formalized as local authorities under ABRC on official Interior Ministry documents that recorded the elected members. Depending on the size of the village, one or two local committee members were elected to serve as village representatives on the Abu-Basma Regional Council.

With few exceptions,⁶ residents in the villages under study expressed an awareness of the local committee system. The heads of local committees identified their jobs as “seeing the demands of the people and meeting them,” and shared that they had frequent contact with ABRC authorities and with state-hired planners (Village leader 2010). Committee members utilized their power as local authorities to approve or reject the plans presented to them by ABRC and succeeded in amending plans found to contradict their constituents' expressed needs. The first plan for residential neighborhoods in Kaser a-Ser exemplifies how the two structures, the local committee and ABRC, worked together to democratize the planning process. The draft plan, which residents criticized as having been made without their consultation—“made from above, like a satellite . . . as if they don't exist” (Kaser a-Ser resident 1 2011)—prescribed denser housing plots, disregarded existing roads, and was designed for a family that had refused to participate in planning. When the planner presented his draft of the neighborhood plan to Kaser a-Ser's local committee, the members voted to reject his proposal and requested that a planner they worked with through the RCUV be commissioned for the project instead (Kaser a-Ser neighborhood planner 2011).

ABRC officials honored this request by hiring the planner familiar to the local committee to begin planning two different neighborhoods, 7 and 9. These neighborhoods were intended for families who were active with the local committee and who had expressed interest in relocating to new neighborhoods. The approved plan prescribed larger residential lots (expanded from 600m² to 1 dunam, 1000m²), adjoined agriculture with some parcels, and accommodated existing roads which had been moved in the master plan (ABRC 2007). The hired planner and an ABRC authority believed the plan better respected residents' needs because it had been commissioned by ABRC, not by

6 Some female residents, adolescents, and the elderly in all villages expressed being unaware of the local committee system.

the Bedouin Administration (Kaser a-Ser neighborhood planner 2011; ABRC Operations Director 2010). The Bedouin Administration was an agency of the ILA, which meant that decisions over the boundaries of residential lots were informed by the presence or absence of land ownership claims. Because Kaser a-Ser residents had lost their land dispute with the government in the 1970s, the Bedouin Administration could minimize lot size and increase housing density; after all, residents did not claim to own any of it.

The new planner, however, was commissioned by ABRC, which meant that objections from Bedouin Administration officials would only be heard in front of the Local Planning and Building Committee. With the backing of Amram Kalaji, then head of ABRC and a respected figure in Israeli government, the support of Kaser a-Ser local committee members, and the forum for the planner to explain his “rationale” for the plan, neighborhoods 7 and 9 were accepted by the Local Planning and Building Committee (Kaser a-Ser neighborhood planner 2011).

Limitations to Consultation through Local Committees

Despite the success of local committees in preparing ABRC localities for recognition and negotiating during the earliest plans, a few years later residents presented a scenario of public representation which differed from those illustrated by ABRC authorities, planners, and some local committee members. In their versions, local committees did not act as intermediaries between planners and residents. Rather, longstanding conflicts among families and generations, gender, the loss of strong leaders, and a family’s location within or outside the village’s planned area complicated participation in local committees.

Feuds among families in Kaser a-Ser over who served in local leadership led residents whose families did not hold the position of local committee head to object to participating, while intergenerational disagreements in Umm Batin divided the dominant family of Abu-Kaf and triggered the local committee’s collapse. In Abu-Krenat, a proactive sheikh who had united the village’s families died. This left Abu-Krenat’s ABRC representative—who was also an engineer employed by the regional council—as residents’ only link to planners (Abu-Krenat resident 1 2010; Abu-Krenat resident 2 2010). Within families, brothers accused each other of appointing themselves and “being off planning on his own” (Kaser a-Ser resident 1 2010; School employee 1 2011; School employee 2 2010). These findings oppose the founding ideology of the committee system. Rather than redistribute the authority of the sheikh to each family, in some cases residents from the largest families sidestepped the local committee or took over leadership after the committee collapsed.

ABRC planners reflected on the limits to public consultation through the committee system. The planners of Umm Batin recalled trying (and failing) to form a women’s sub-committee of the local committee. Local committees met in the *sheig*, a meeting area restricted to men. With the exception of local leaders’ immediate family members, (Female family of village leader 2011) all female respondents had heard about changes in

the village through “gossip” with other women. Women believed that they would participate in designing their new homes in the future (Female student 2011; School employee 3 2011; School employee 4 2011; Housewife 2011). When ABRC planners and social consultants learned about the barriers to public consultation, they implemented alternate mechanisms such as an “open door policy,” home visits, and household surveys. The household survey, written in Arabic, was found to net hundreds of responses (Planner of ABRC Agricultural Initiative 2010).

Some of these mechanisms reproduced the same power dynamics that had limited the effectiveness of local committees, however. The “open door policy” instituted by Umm Batin’s planners sought to provide a confidential meeting space for all residents outside of the village by inviting drop-in visits to the planners’ offices in a neighboring town. Ultimately, the only residents who utilized the mechanism were men in power: *sheikhs*, local committee members, and heads of families. Utilizing personal cars, literacy, education, gender, and family position, ABRC residents with the most social and financial capital appeared to possess more influence over planning.

Formalizing Existing Development by “Translating It”

Planners hired to design ABRC localities explained having learned about the unique socio-spatial concerns of the Bedouins after the seven townships failed to attract the full Bedouin population of the Negev. With the input of social consultants and ABRC residents, planners working for ABRC and the Bedouin Authority ascertained that Bedouin villages, unlike Jewish localities, could not be “planned by a model” (Planners of ABRC Agricultural Initiative 2010; Planner of Abu-Krenat 2010). Planners formalized existing development—what they termed “social infrastructure with a physical expression”—by “translating it” into a planning language (Planner of Abu-Krenat 2010).

New designs considered topography, family affiliations and sizes, gender norms and gendered spaces, land claims, population growth, existing open space, infrastructure and housing, and residents’ occupations within the village borders set by Partial District Outline Plan 4/14/23 (Planning Administration 2019) and its amendments. In villages where an outstanding land dispute remained between residents and the ILA, corresponding residential parcels were marked in neighborhood plans and preserved for the claimant and his male descendants (Planner of Umm Batin 2010). Umm Batin’s Northern Neighborhood illustrates how some housing lots reflected the boundaries of residents’ filed claims and accommodated existing development, therefore appearing somewhat irregular (ABRC and Bnei Shimon 2015). Such an approach acknowledged residents’ demands to remain on their lands and facilitated the formalization of other spatial expressions of Bedouin culture, such as neighborhoods for hamulot, or extended families, and open areas within neighborhoods that enabled women to pass on their family’s lands unaccompanied by a male family member.

Planning villages before the settlement of land disputes marked an additional difference between ABRC and the seven townships, as residents could use the new public services provided in their villages while remaining in the homes they had constructed prior to recognition (Attorney for Southern District 2011). ABRC tasked planners with designing service centers immediately following master planning to meet residents' needs amid a complicated and delay-ridden neighborhood development process. To rebuild their homes in recognized neighborhoods, residents were required to lease a residential parcel from the ILA, hire an architect to plan their house, and then obtain a building permit from the municipal engineer. Those who maintained outstanding landownership claims had to certify the ILA as the parcel's owner before obtaining a lease. Individuals completing the process would then receive a compensation package for their land and the demolition of existing structures which varied based on the land's quality and location with respect to the village borders (Attorney for Southern District 2011; ABRC Engineer 1 2011).

As of 2015, eight years after the approval of Kaser a-Ser's Neighborhoods 7 and 9 and nine years following the construction of a new school and clinic, no Kaser a-Ser resident had built a home in a planned neighborhood. These setbacks to neighborhood development indicated to some academics and ABRC planners that "Amram . . . was very smart in getting all the budgets to build the schools and so forth. He said, let's do what we can. Let's provide services, let's give them education, let's give them what they need" (Kaser a-Ser neighborhood planner 2011). A new public facility in Kaser a-Ser and an existing resident-provided solution to neighborhood service provision, trash burning, are found in Figure 2. Unrecognized housing can be seen to the left and right of the clinic.



Figure 2 New public facility and existing neighborhood service, trash burning.

Source: Researchers' survey, 2011.

Plan Implementation: Clashing Rationalities Surface

Challenges to Plan Implementation: Resident Perspective

A combination of financial barriers, cultural needs, and political objections prohibited residents from fulfilling neighborhood plans. Seven years after the approval of Abu-Krenat's Neighborhood 1, only three residents had demolished their homes, obtained permits, and relocated to the neighborhood. Unrecognized development (left) and legal housing (right) in Neighborhood 1 can be seen in Figure 3. Bedouins in all ABRC localities pointed to unaffordability as a barrier to neighborhood development. A man who had rebuilt his home in Abu-Krenat had moved two kilometers away from his unrecognized village after paying "thousands of shekels," NIS 180k (U.S. \$52k), to purchase his lease and building permit (Abu-Krenat resident 1 2011). Household services were not provided to incomplete neighborhoods; as a result, the resident had to provide services on his own. He used a generator which cost him 300 shekels (U.S. \$87) for every four hours of use, dumped his sewage in a pit, burned his garbage, and relied on an illegal water hookup.

The man's experience indicated to others that "no one can afford to be recognized;" it also dissuaded them from following suit (Abu-Krenat Resident 2 2011). A resident of Abu-Asheba, an unrecognized village outside of Abu-Krenat, explained: "If they want them to move [to Abu-Krenat], they will move to be closer to everything for the children. But first they need to have what there! God willing, we will just go on building, put up the permanent foundations and stay here with or without recognition" (Abu-Asheba resident 1 2011). Abu-Asheba residents had been told by enforcement authorities that they needed to relocate to Abu-Krenat and found demolition notices posted on their homes. Even when faced with the threat of housing demolition, however, they refused the costs and conditions associated with living in a legal neighborhood.

The requirement that Bedouins terminate their outstanding claims, ongoing housing demolitions, and the exclusion of existing neighborhoods from the planned area of ABRC localities indicated to residents that the council was a "trick" (Village leader 2010) to take their lands and concentrate all Bedouins in townships similar to Rahat or Tel Sheva. Bedouins living in unrecognized neighborhoods celebrated the new schools and clinics ABRC had constructed, but drew on the past to indicate that the undergirding ideology remained the same: "You can see it plain and clear; it is in the history. With the Bedouin, they [the state] want them all to be concentrated" (Abu-Asheba 2 2011). Residents also identified the program as double-edged: "Officially they're there to plan, build, put infrastructure, and put schools. Unofficially, they're there to take land from the Bedouins because even when the state recognizes the village . . . it just recognizes the people and the village and not their landownership" (Village leader 2010).



Figure 3 Abu-Krenat's Neighborhood 1 viewed from unrecognized development.

Source: Researchers' survey, 2011.

Bedouins living outside of ABRC localities reasoned that “Abu-Basma is not just” because the state continued to utilize housing demolitions to realize plans. Children were dragged from their houses before dawn and cried as they watched their homes collapse (Abu-Asheba resident 3 2011). These respondents observed that the blue lines which excluded their neighborhoods were irrational from a planning perspective and threatened their way of life. The Abu-Ashebe family described how the state’s exclusion of their village of 400 people disregarded land uses they had made to optimize their economy and living conditions. Abu-Ashebe residents had been told by the Bedouin Authority to relocate to a new neighborhood in Abu-Krenat on hilly, agricultural lands, but explained that, “there is a reason why they are here and not there, and that is because it [the land in Abu-Krenat] is better for farming than living” (Abu-Asheba resident 2 2011). Abu-Ashebe residents concluded that such an illogical decision must have been politically motivated: “ABRC must be tool to take people’s land” (Abu-Asheba resident 1 2011).

Relocating Bedouins from outside ABRC borders to new neighborhoods within them conflicted with Bedouin laws and settlement norms. Residents whose lands were excluded by Sub-District Plan 4/14/23 did not want to move to dense neighborhoods on another family’s lands. Settling in 1000m² plots conflicted with the traditional model

of growing families together over time as sons married and had children. Kaser a-Ser residents explained, “if we had the whole land, the whole El-Hawashala [points across Highway 25] we would have enough space, but the plan wants to squeeze everyone in one corner . . . in 10, 15 years there won’t be a place for everyone” (Kaser a-Ser resident 2 2011). The head of Umm Batin’s local committee illustrated two clashing models of growth by drawing the centrifugal, generational model utilized by Bedouins and, in contrast, a rectangular, residential plot in an ABRC neighborhood. His illustration appears in Figure 4.

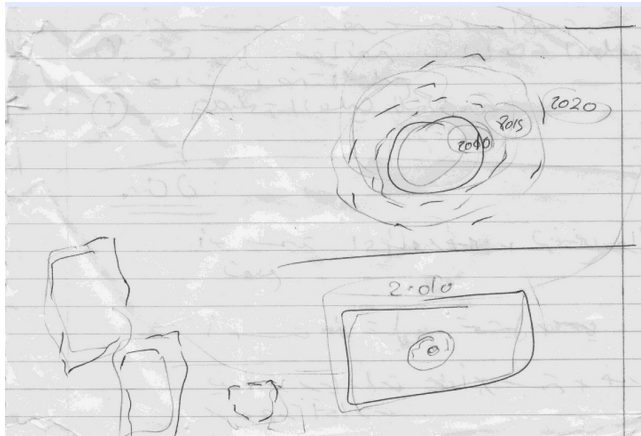


Figure 4 Bedouin growth model (top) versus prescribed model (bottom).

Source: Village leader, 2010.

Bedouin law also superseded the leases the ILA had assembled to facilitate neighborhood development. The ILA leased residential parcels to residents who were not the land’s historic claimants. Regardless of whose name was listed in a government document, the land belonged to the historic occupants in the eyes of the Bedouin (School employee 5 2010). Bedouins would not build on another family’s land; instead, the traditional landholder would lease his land back from the family the ILA had leased it to in order to preserve space for his descendants. The ILA’s requirements therefore made no sense to residents: “To give away land to buy it back? They will not agree, but the state expects them to” (School employee 5 2010). Moreover, they left Bedouins who lived outside of ABRC borders in a particularly difficult situation. These residents faced housing demolitions, but could not move to the neighborhoods that had been planned for them.

Challenges to Plan Implementation: State and Planner Perspective

State employees and planners of ABRC master plans attributed slow neighborhood development to residents’ lack of knowledge about the process, a desire to maximize individual gains, and “irrational” demands which “go beyond the rights of other citi-

zens” (Planner of Abu-Krenat 2010). Terminating land claims and leasing parcels from the ILA was not malicious, but a procedural act of “giv[ing] up his paper for another,” according to ABRC’s Municipal Engineer (ABRC engineer 1 2011). Residents were frustrated, the engineer explained, because they did not understand how to obtain a lease and building permit and therefore incurred additional expenses, such as hiring architects twice after mistakenly planning over a neighbor’s parcel. An ABRC master planner who had worked with other state authorities suggested that residents had not followed the legal home building process because they did not want to pay taxes or relinquish their land claims (Planner of Abu-Krenat 2010). The planner lamented that permitting was part of the recognition “agreement,” in which Bedouins were expected “to abide by the rules like every other citizen of Israel” in exchange for planning and services.

District-level officials suggested that residents stalled the neighborhood development process for several reasons. Residents whose unrecognized dwellings fell within the planned area of the village had not terminated their land claims and begun to rebuild because they sought to block other families from relocating to lands they perceived as theirs. Moreover, should these residents maintain and even expand their illegal construction on plots assigned to other families or set aside for infrastructures, they could negotiate for higher amounts of compensation later (Attorney for Southern District 2011). Formalizing additional Bedouin villages after the seven Bedouin townships sent the message to residents of unrecognized neighborhoods that, “if they stay, they get something better” (District planner 2010). Therefore, lethargic neighborhood growth was attributed to Bedouins’ lack of understanding the legal building process, outdated territorial claims, a selfish valuation of individual gains over the public good and the state’s shift in policy towards legalizing unrecognized villages.

Planning over existing development provided additional complications. The unique approach created situations in which residents’ land claims and some of their land uses did not conform with regulations, best practices, or the plan’s prescriptions. Land uses which were complimentary in modern planning practice were challenged by land uses residents had developed based on Bedouin laws and traditions. Bedouin roads, for example, are often planned on higher ground, while state guidelines promote the construction of roads in low-lying areas to accommodate sewage infrastructure (Kaser a-Ser neighborhood planner 2011). Existing parks and housing in flood plains contradicted environmental guidelines (Planner of Umm Batin 2010; Director of Statutory Planning for ABRC 2011). Service center plans which zoned public facilities and infrastructure on lands claimed by residents triggered tense, sluggish, and costly negotiations with claimants to facilitate plan implementation. These agreements moved forward despite a 1965 law that enables the state to expropriate 40 percent of property for the public good (Planning and Building Law, 5725-1965).

In some cases, resident opposition to the expropriation of their land for a public use resulted in facilities and infrastructures that were unsafe and barely served their

purpose. Umm Batin's main thoroughfare, colloquially referred to as the "saucer road" by ABRC engineers, took three years to build. The road narrows to bypass a resident's land (ABRC engineer 2 2011; ABRC Operations Director 2010). The street is so narrow that sidewalks could not be built, and it is lined with tall, metal walls that mark the limits of the resident's claims. Road signs have been removed or damaged. The researchers experienced how the road's irregular shape obscures visibility and compromises safety after a near-collision with an oncoming vehicle. Similarly, a gym in Umm Batin was reduced to one basketball court after a resident had marked his lands with a wall, blocking builders from constructing the full facility. An ABRC engineer who had worked on both projects could not understand why residents would oppose projects designed to serve them. "They all wanted the road, but now they are causing troubles that stop it," he remarked. "If you are looking for sense here, you are looking in the wrong place" (ABRC engineer 2 2011). The Umm Batin "saucer road" appears in Figure 5.



Figure 5 Umm Batin "saucer road" and metal walls marking land claims.

Source: Researchers' survey 2011.

District-level authorities acknowledged that some residents took issue with the limits set on ABRC localities. They explained that abutting land uses blocked the extension of the village borders. ABRC's blue lines had been determined after court battles between Bedouins and the state and negotiations among government authorities designated Negev lands for industrial development, infrastructure, other municipalities, and military areas. Members of the Hawashala tribe, for whom Kaser a-Ser had been planned, lost their land claims in the mid-1970s after Beer Sheva Court decided in favor of the Israel Lands Administration (Kaser a-Ser resident 2 2011; Attorney for Southern District 2011; Kaser a-Ser resident 3 2011). The ILA then divided Hawashala lands among Dimona, the Department of Transportation and the Israel Defense Forces. The Department of Transportation built Highway 25 through Hawashala, which was later used to mark the eastern border to Kaser a-Ser. A new neighborhood in Kaser a-Ser had been planned for the 10 percent of Hawashala residents who lived on the other side

Highway 25. ABRC villages like Kaser a-Ser would grow over time to accommodate residents who, according to Israeli law, sat on land that was not theirs.

ABRC planners and state employees further argued that “the land isn’t everything” (Attorney for Southern District 2011). Building sustainable localities that could maintain their facilities and infrastructure would not be possible by recognizing all development on all of the lands that Bedouins claimed to own. ABRC localities were the few villages that were “logical” and “plannable”; “they have at least 300 families, a central area for people to meet, and some understandable organization” (Planner of Abu-Krenat 2010). Providing utilities to other low-density settlements across the Negev would be cost prohibitive and keep residents reliant on state subsidies (Planner of Abu-Krenat 2010; Attorney for Southern District 2011). Within villages, individual households were not connected to services because their neighborhoods had not been filled. This policy was developed after piecemeal service provision to the Bedouin townships created roads and sidewalks that were half-paved and unlit by street lights. As the neighborhood grew, the infrastructure became incompatible. The financial burden of reintroducing new infrastructure to Bedouin localities—Israel’s poorest—was extreme (Kaser a-Ser neighborhood planner 2011). Therefore, according to the majority of interviewed ABRC planners and state employees, the purpose of designing and building denser localities was not to concentrate Bedouins for political gains, but to ease the provision of services and ensure that each locality could maintain its infrastructure over time.

Discussion

Illuminating the processes, forums, actors, and outcomes associated with planning Bedouin localities in the Abu-Basma Regional Council highlighted a distinct tension among stakeholders’ views of the program’s procedures, results, and intentions. ABRC planners expressed that ABRC marked a “big change in attitude,” (Planner of Abu-Krenat 2010) while residents explained, “you can see it . . . in the history. With the Bedouin, they [the state] want them all to be concentrated” (Abu-Asheba resident 2 2011). The findings suggest a clash of rationalities between most planners and government administrators and ABRC residents, which played out inside and outside of planning forums and over space. This clash demonstrated a significant power differential between the State of Israel and the Arab-Bedouin. In answering the research question, the authors therefore felt it necessary to examine the disparate theories evoked by stakeholders. The theories we have selected here include one from the Global North, communicative planning theory (CPT) (Healey 1997; Healey 1992), and one from the Global South, planning-as-control (Yiftachel 1998), as well as its offshoot, “variegated recognition” (Yiftachel, Goldhaber and Nuriel 2009).

CPT, a planning theory with a “normative dimension” and “procedural values” (Healey 2007, 69) argues that planning should serve as a tool for social and environmental justice through “inclusionary participatory democratic practice” (Healey 2006,

294). CPT has popularized conversations in planning theory over the past 25 years in response to rational/procedural planning solutions, which undervalued public knowledge in favor of technocratic expertise (Healey 1997). CPT planners are good listeners who develop forums and mechanisms which can augment the voices of the unheard and marginalized and who are simultaneously on the lookout for dominating actors or practices (Innes 1998). Case studies have examined both planners and planning forums to understand their communicative qualities and therefore improve practice (Healey 1992; Throgmorton 1996).

Planning-as-control theory was introduced in the late 1990s by Israeli geographer Oren Yiftachel to respond to a trend in planning thought which assumed that the discipline had progressive social and environmental intents. Drawing from his background working with ethnic minorities in Israel, Yiftachel proposes that planning is “double-edged” (Yiftachel 1998, 395). It has the potential to be reformist and lead to an improvement in people’s lives, as well as to be oppressive and lead to “a regressive deepening of intergroup disparities, inequalities, or undemocratic domination” (Yiftachel 1998, 395). Rather than tell the story of a planner’s day (as CPT has done), planning-as-control, an explanatory theory, reorients scholars to focus on both geographic and institutional territories and highlights the efforts of non-state actors to shape their own spaces. The impacts of government planning on “space, power, wealth and identity” are understood as indicators of power differentials, which can be examined for their reformist and/or regressive expressions (Yiftachel 1998, 403; Kamete 2009).

How Useful is Planning Theory to Understanding Practice in the Global South?

We found the prescriptive/normative and explanatory capabilities of our chosen theories useful to understanding the ABRC case, particularly when considered together. CPT highlighted “episodes” of planning which could be analysed based on their promotion of CPT values such as “democratic, multi-vocal citizenship” (Healey 2007, 78). The utility of CPT was tangible during meetings and mechanisms that the researchers had observed and asked about, such as Local Planning Committee meetings, local committees, and household surveys. CPT’s focus on “institutional ‘sites’” (Healey 2007, 67) highlighted the ways in which ABRC worked. Using its position as an authority separate from the ILA, ABRC commissioned plans for service centers before the settlement of land disputes and utilized its institutional space apart from the Bedouin Authority to hire planners who residents were more comfortable with and who solicited resident input.

Sharing how ABRC engineers went about their daily work and how they felt about it may be, like CPT’s practice stories, “narrow and partial” (Yiftachel 1998, 396). But, it is perhaps for this very reason that the approaches, biases, emotions, and limitations of ABRC engineers, important actors who interacted with residents and possessed some power over the realization of plans, could be understood. It is CPT’s narrowness, its

focus on the “fine grain of the daily routines, discourses and practices of governance” (Healey 2003, 109), that highlighted moments where conflicting ideologies surfaced. For instance, a Bedouin Authority planner marched out of a Local Planning Committee meeting out of frustration with a proposal to extend the planned area of a village to accommodate existing development (Local Planning and Building Committee – ABRC 2011). CPT also humanized planners as practitioners motivated to improve Bedouins’ standard of living despite the constraints set on them by earlier court decisions and district plans.

Explanatory theories issued from the Global South helped the researchers understand how the methods described by participants translated into ABRC’s outcomes. Participant observation at meetings between ABRC’s permitting officer and residents, for example, highlighted the frustration residents felt while trying to navigate the costly and foreign permitting process. Visiting this forum did not explain why only a small number of residents had begun the process, however. The majority of residents had refused to obtain documentation for financial reasons or out of objections to decisions made prior to local planning by other authorities, such as the location of village borders, the requirement that residents terminate their land claims before obtaining a residential plot, and the prescribed density of villages. The shifting focus to space, both geographic and institutional—beyond the limitations of ABRC, the chosen case—illuminated the drivers of the present development stalemate.

“Variegated recognition,” a 2009 theory from Yiftachel, Goldhaber and Nuriel (2011), is particularly useful here. The authors identify three main types of recognition on a continuum that ranges from reform to control: “affirmation,” the legitimization of group identities through the fair distribution of power and resources; “indifference,” the passive acceptance of individuals and rejection of their group identities; and, “hostility,” the singling out of a group based on its identity to cause harm (120). This lens was wider than CPT. Our frame around ABRC villages and some of the unrecognized neighborhoods in close proximity to blue lines illustrated that some residents were treated with more “indifference” than others. Cleavages among residents, such as the location of their housing and land claims, their gender, and their family indicated whether or not they were part of a more empowered minority that was protected from housing demolitions, received small financial gains, and entered neighborhood planning earlier. Shifting our attention to ethnic identity and impacts, particularly on “neighbouring people and communities” (Yiftachel 1998, 403), we find that the small gains made by privileged ABRC residents paled in comparison to the benefits awarded to surrounding Jewish municipalities, such as Dimona. In line with this thinking, we ask: Why was Dimona, a Jewish city, awarded Hawashala land instead of the Hawashala tribe?

This question would probably yield different answers when posed to a CPT theorist and to Yiftachel. CPT, with its future orientation, might suggest that government decisions which allocated Hawashala land predated the project at hand and therefore

should not inhibit present opportunities for communication and transformation. CPT might identify forums through which Bedouin civil society could agitate for additional lands to promote CPT's value of social justice, while encouraging planners to bring all resident voices to the negotiating table with district level planning authorities. Indeed, it is CPT's focus on spaces for change that illuminated operational, locational and personnel-related differences between government agencies and enabled well-intentioned planners to plan in a way that better prioritized residents' interests. However, this limited (but important) view might have missed the roles of the IPA, the ILA, the military, and the Ministry of Justice in forcefully expropriating Bedouin lands and implementing the Goldberg Report and Beer Sheva Plan 4/14/23, the prescriptions of which guided planning for ABRC localities.

Planning-as-control might answer that the Southern District Court, the body which decided in favor of the Lands Administration when the Hawashala land claims were adjudicated, operates within the Israeli Ministry of Justice. Its norms and policies have been set by the State of Israel, a self-proclaimed Jewish state. While Bedouins are citizens—and therefore expected to “abide by the rules like every other citizen,” (Planner of Abu-Krenat 2010) as an ABRC planner emphasized—they are ethnic minorities within a country whose core, founding ideology is the establishment of a Jewish nation and therefore the preservation of a Jewish demographic majority (Orenstein, Jiang and Hamburg 2011). ABRC planners and administrators might have been well-intentioned, but they worked within the apparatus of an ethnic state. Regardless of the transformative intentions of its actors, ABRC advanced an aspiration that was set in the early days of nation building: to control Bedouin population growth by restricting the area of Bedouin municipalities and limiting the size and number of residential plots in their neighborhoods. Assigning Hawashala lands to Dimona and other authorities facilitated the relocation of residents living on the other side of Highway 25 to a denser neighborhood where, indeed, “in 10, 15 years there won't be a place for everyone” (Kaser a-Ser resident 2 2011).

Planning theories from the Global South and North both have utility in explaining a state planning initiative for an ethnic minority in the Global South. However, the more normative/prescriptive theory, CPT—engineered in Europe and North America—cannot be applied on its own without planning-as-control, our explanatory theory developed in the Middle East. CPT on its own risks misattributing fundamental challenges to the ABRC program, such as resident opposition to neighborhood development, to a communication breakdown rather than to a fight for Bedouin economic and cultural survival.

Pairing CPT's attention to the “fine grain” (Healey 2003, 109) of practice and planning-as-control's close eye to resource distribution can illuminate the rationalities guiding spatial changemaking if CPT's basic assumptions about the beneficial nature of planning can change. CPT's guidance for planners to serve as progressive changemakers who are future-oriented needs grounding in planning-as-control's his-

toric and institutional contexts. In this way, CPT's future orientation will not miss the profession's deep, and sometimes sinister, link to the past. Incorporating elements of CPT within planning-as-control could highlight the tangible episodes of progression and regression in spatial decision-making and their measurable outcomes, the causes of which would be more accurately assigned. For the case, such a pairing would highlight legacies of mistrust between Bedouins and the State, earlier planning decisions and rationalities which have shaped the Negev, as well as the institutional limitations of planners and local authorities.

Studies like ours, which illuminate a diversity of voices from within the Global South, are essential to improving planning scholarship and to building new trajectories. Scholars and practitioners familiar with the unique range of actors and organizations involved with spatial change, the complexities of interventions occurring within and outside planning institutions, and the colonial legacies which undergird them must be heard. Further empirical research should continue to highlight cases in which human survival and imposed rules, visions and procedures may clash. Theory can help illuminate power differentials between actors, so that calls to "meet in the middle" by state bodies and corporations are shown for what they are: true compromises or demands for less empowered actors to give in. Theory-informed prescriptions can suggest a distribution of resources which considers legacies of injustice at a similar value to legal precedents. We therefore support the calls by Watson (2008), for "a widening of the scope of planning thought while grounding it specifically in the highly differentiated contexts within which planners work" (2261).

References

- ABRC (Abu-Basma Regional Council). 2007. Kaser a-Ser Neighborhoods 7 and 9. [In Hebrew.] Beer Sheva. <http://mavat.moin.gov.il/mavatps/forms/sv3.aspx?tid=3>.
- ABRC (Abu-Basma Regional Council). 2010. Our Mission and Our Policy. Beer Sheva: Abu-Basma Regional Council.
- ABRC (Abu-Basma Regional Council) engineer 1, interview by author, Beer Sheva, January 18, 2011.
- ABRC (Abu-Basma Regional Council) engineer 2, interview by author, Umm Batin, January 18, 2011.
- ABRC (Abu-Basma Regional Council) Operations Director, interview by author, Umm Batin, October 10, 2010.
- ABRC (Abu-Basma Regional Council) and Bnei Shimon (Bnei Shimon Regional Council). 2015. The Northern Neighborhood, Umm Batin. [In Hebrew.] Beer Sheva. <http://mavat.moin.gov.il/mavatps/forms/sv3.aspx?tid=3>.
- Abu-Rabia-Queder, Sarab. 2019. "Embedded Economy and Empowerment: Public/private Revisited." *Women's Studies International Forum* 77 (November-December).
- Abu-Asheba resident 1, interview by author, Abu-Asheba, January 23, 2011.
- Abu-Asheba resident 2, interview by author, Abu-Asheba, January 23, 2011.

- Abu-Asheba resident 3, interview by author, Abu-Asheba, January 23, 2011.
- Abu-Krenat resident 1, interview by author, Abu-Krenat, January 23, 2011.
- Abu-Krenat resident 2, interview by author, Abu-Krenat, January 23, 2011.
- Abu-Rabia, Aref. 2001. *A Bedouin Century: Education and Development among the Negev Tribes in the 20th Century*. New York: Berghahn.
- Abu-Saad, Ismael. 2008. "Spatial Transformation and Indigenous Resistance: The Urbanization of the Palestinian Bedouin in Southern Israel." *American Behavioral Scientist* 51, no. 12 (August): 1713-1754.
- Abu-Saad, Ismael. 2014. "State-Directed Development as a Tool for Dispossessing the Indigenous Palestinian Bedouin-Arabs in the Naqab." In *Decolonizing Palestinian Political Economy*, 138-157. Edited by Mandy Turner and Omar Shweiki. London: Palgrave.
- Abu-Saad, Ismael and Cosette Creamer. 2012. "Socio-Political Upheaval and Current Conditions of the Naqab Bedouin Arabs." In *Indigenous (In)Justice: Human Rights Law and Bedouin Arabs in the Naqab/Negev*, 18-66. Edited by Ahmad Amara, Ismael Abu-Saad, and Oren Yiftachel. Cambridge: Harvard University Press.
- Al-Kasum Regional Council. 2018. *Moatza Ezorit Al-Kasum*. www.alqasoum.org.il.
- Arieli, Tamar. 2018. "Negev Bedouins and the State of Israel: Social Conflict and Territorial Dispute." *California Western International Law Journal* 49, no. 1: 81-102.
- Attorney for Southern District, interview by author, Beer Sheva, March 31, 2011.
- Begin, Ze'ev. 2013. "Regularization of Bedouin Communities in the Negev." *State of Israel*, January 23, 2013. <https://mfa.gov.il/MFA/PressRoom/Documents/begin-bedouin270113.pdf>.
- Berman-Kishony, Talia. 2008. "Bedouin Urbanization Legal Policies in Israel and Jordan: Similar Goals, Contrasting Strategies." *Transnational Law and Contemporary Problems* 17, no. 2: 393-412.
- Elsana, Morad. 2018. "Indigenous Peoples' Land: The Bedouin Land in Israel." *California Western International Law Journal*. 49, no. 1: 61-79.
- De Satgé, Richard and Vanessa Watson. 2018. *Urban Planning in the Global South: Conflicting Rationalities in Contested Urban Space*. London: Palgrave Macmillan.
- Diamond, Gary M., Aneese Farhat, Mahmud Al-Amor, Salman Elbedour, Karni Shelef and Rachel Bar-Hamburger. 2008. "Drug and Alcohol Use Among the Bedouin of the Negev: Prevalence and Psychosocial Correlates." *Addictive Behaviors* 33, no. 1 (February): 143-151.
- Dinero, Steven C. 2004. "New Identity/identities Formulation in a Post-nomadic Community: The Case of the Bedouin of the Negev." *National Identities* 6, no. 3: 261-275.
- Dinero, Steven C. 2010. *Settling for Less: The Planned Resettlement of Israel's Negev Bedouin*. New York: Berghahn.
- Director of Statutory Planning for ABRC, interview by author, Beer Sheva, March 29, 2011.
- District planner, interview by author, Beer Sheva, November 29, 2010.
- Dunsky, Nahum. 2009. "Plan for the New Bedouin Villages of the Negev." [In Hebrew.] Presentation to the Annual Convention of the Engineering Group of the Planning Administration, Jerusalem, November.
- Elsana, Morad. 2019. "Indigenous Peoples' Land: The Case of Bedouin Land in Israel." *California Western International Law Journal* 49: 61-79.

- Female family of village leader, interview by author, Northern Negev, March 24, 2011.
- Female student, interview by author, Northern Negev, March 24, 2011.
- Fenster, Tovi. 1999. "Space for Gender: Cultural Roles of the Forbidden and the Permitted." *Environment and Planning D: Society and Space* 17, no. 2: 227-246.
- Golan, Patricia. 2007. "Beduin in Limbo." *The Jerusalem Post* (Jerusalem, Israel), January 24, 2007.
- Harrison, Philip. 2014. "Making Planning Theory Real." *Planning Theory* 13, no. 1 (February): 65-81.
- Harrison, Philip. 2006. "On the Edge of Reason: Planning and Urban Futures in Africa." *Urban Studies* 43, no. 2 (February): 319-335.
- Healey, Patsy. 2006. *Collaborative Planning: Shaping Places in Fragmented Societies*, 2nd ed. New York: Palgrave MacMillan.
- Healey, Patsy. 2003. "Collaborative Planning in Perspective." *Planning Theory* 2, no. 2: 101-123.
- Healey, Patsy. 2007. "The New Institutionalism and the Transformative Goals of Planning." In *Institutions and Planning*, 61-87. Edited by Niraj Verma. Oxford: Elsevier.
- Healey, Patsy. 1992. "A Planner's Day- Knowledge and Action in Communicative Practice." *Journal of the American Planning Association* 58, no. 1 (Winter): 9-20.
- Horner, Deborah F. 1982. "Planning for Bedouin: The Case of Tel Sheva." *Third World Planning Review* 4, no. 2: 159-176.
- Housewife, interview by author, Northern Negev, January 23, 2011.
- Human Rights Watch. 2008. *Off the Map: Land and Housing Rights Violations in Israel's Unrecognized Bedouin Villages*. New York: Human Rights Watch.
- Innes, Judith E. 1998. "Information in Communicative Planning." *Journal of the American Planning Association* 64, no. 1 (Winter): 52-63.
- Jackson, Susan. 1997. "A Disturbing Story: The Fiction of Rationality in Land Use Planning in Aboriginal Australia." *Australian Planner* 34, no. 4: 221-6.
- Jiryis, Sabri. 1973. "The Legal Structure for the Expropriation and Absorption of Arab Lands in Israel." *Journal of Palestine Studies* 2, no. 4 (Summer): 82-104.
- Kamete, Amin Y. 2009. "In the Service of Tyranny: Debating the Role of Planning in Zimbabwe's Urban 'Clean-up' Operation." *Urban Studies* 46, no. 4 (April): 897-922.
- Kaser a-Ser neighborhood planner, interview by author, Jerusalem, April 7, 2011.
- Kaser a-Ser resident 1, interview by author, Kaser a-Ser, March 1, 2011.
- Kaser a-Ser resident 2, interview by author, Kaser a-Ser, March 1, 2011.
- Kaser a-Ser resident 3, interview by author, Kaser a-Ser, March 24, 2011.
- Kressel, Gideon M., Joseph Ben-David, and Khalil Abu-Rabia. 1991. "Changes in Land Usage by the Negev Bedouin since the Mid-19th Century." *Nomadic Peoples* 28: 28-55.
- Lithwick, Harvey. 2000. *An Urban Development Strategy for the Negev's Bedouin Community*. Beer Sheva: Negev Center for Regional Development.
- Lo Piccolo, Francesco. 2008. "Planning Research 'with' Minorities in Palermo: Negotiating Ethics and Commitments in a Participatory Process." *Planning Practice and Research* 23, no. 2 (May): 187-209.

- Local Committee. 2006. The First Newsletter to Summarize Our Situation. [In Arabic.] Umm Batin: Local Committee of Umm Batin.
- Local Planning and Building Committee - ABRC (Abu-Basma Regional Council). Participant observation during meeting. Beer Sheva, January 25, 2011.
- Marx, Emanuel. 1997. "The Tribe as a Unit of Subsistence: Nomadic Pastoralism in the Middle East." *American Anthropologist* 79, no. 2: 343-363.
- Meir, Avinoam. 1997. *As Nomadism Ends*. Boulder [CO]: Westview Press.
- Meir, Avinoam. 2005. "Bedouin, the Israeli State and Insurgent Planning: Globalization, Localization or Glocalization?" *Cities* 22, no. 3: 201-215.
- Meir, Avinoam. 2011. "Gendered Space, Power Relationships and Domestic Planning and Design among Displaced Israeli Bedouin." *Women's Studies International Forum* 34, no. 3 (May-June): 232-241.
- Meir, Avinoam. 1998. "Nomads and the State: The Spatial Dynamics of Centrifugal and Centripetal Forces Among the Israeli Negev Bedouin." *Political Geography Quarterly* 7, no. 3 (July): 251-270.
- Meir, Avinoam. 2009. "What Public, Whose Interest: The Negev Bedouin and the Roots of Planning from Below." *Geography Research Forum* 29 (January): 101-131.
- Meir, Isaac A. and Ilan Stavi. 2011. "Evolution of the 'Modern' Transitory Shelter and Unrecognized Settlements of the Negev Bedouin." *Nomadic Peoples* 15, no. 2 (Winter): 33-52.
- Negev Coexistence Forum. 2010. Response to the Report on the State of Israel on Implementing the Covenant on Economic, Social and Cultural Rights (ICESCR). Omer, Israel: NCF.
- Neve Midbar Regional Council. 2017. Moatza Ezorit Neve Midbar. www.nevemidbar.org.il.
- Orenstein, Daniel E., Leiwen Jiang, and Stephen P. Hamburg. 2011. "An Elephant in the Planning Room: Political Demography and its Influence on Sustainable Land-Use Planning in the Drylands." *Journal of Arid Environments* 75, no. 6 (June): 596-611.
- Planner of Abu-Krenat, interview by author, Ramat Gan, December 12, 2010.
- Planner of Umm Batin, interview by author, Omer, August 2010.
- Planners of ABRC Agricultural Initiative, interview by author, Beit Cama, December 19, 2010.
- Planning Administration. 2019. "Partial District Outline Plan for the Beer Sheva Metropolitan Area - Plan 4/14/23." [In Hebrew.] Southern District Outline Plans. https://www.gov.il/he/departments/guides/tamam_south?chapterIndex=2.
- Porter, Libby. 2011. "The Point is to Change It." *Planning Theory & Practice* 12, no. 4 (December): 477-480.
- Rudnitzky, Arik and Thabet Abu-Ras. 2012. *The Bedouin Population in the Negev*. Lod, Israel: The Abraham Fund Initiatives.
- Rudoren, Jodi. 2013. "In Israeli Plan, Bedouins See a Threat to their Way of Life." *The New York Times* (New York), December 7, 2013. <https://www.nytimes.com/2013/12/08/world/middle-east/in-an-israeli-plan-bedouins-see-a-threat-to-their-way-of-life.html>.
- School employee 1, interview by author, Northern Negev, January 7, 2011
- School employee 2, interview by author, Northern Negev, March 15, 2010.
- School employee 3, interview by author, Northern Negev, December 26, 2011.

- School employee 4, interview by author, Northern Negev, December 26, 2011.
- School employee 5, interview by author, Northern Negev, December 26, 2010.
- Scott, Mark. 2019. "Reflecting on Theory and Practice." *Planning Theory & Practice* 20, no. 1: 3-7.
- Shmueli, Deborah and Rassem Khamaisi. 2011. "Bedouin Communities of the Negev: Models for Planning the Unplanned." *Journal of American Planning Association* 77, no. 2 (Spring): 109-125.
- Shmueli, Deborah and Rassem Khamaisi. 2015. *Israel's Invisible Negev Bedouin: Issues of Land and Spatial Planning*. New York: Springer.
- Social Consultant to ABRC Villages, interview by author, Beer Sheva, November 29, 2010.
- Swirsky, Shlomo and Eti Connor-Atias. 2017. *Social Snapshot: 2016*. [In Hebrew.] Tel Aviv: AdvaCenter. <https://adva.org/wp-content/uploads/2017/03/SocialReport2016.pdf>.
- Swirsky, Shlomo and Yael Hasson. 2006. *Invisible Citizens: Israel Government Policy Towards the Negev Bedouin*. Tel Aviv: Adva Center.
- Thomas, Michael J. 1979. "The Procedural Planning Theory of A. Faludi." *Planning Outlook* 22, no. 2: 72-76.
- Throgmorton, James A. 1996. *Planning as Persuasive Storytelling: The Rhetorical Construction of Chicago's Electric Future*. Chicago: University of Chicago Press.
- "Unrecognized Villages." Adalah, 2012. <https://www.adalah.org/en/content/index/2008>.
- Village leader, interview by author, Beer Sheva, October 17, 2010.
- Walker, Ryan and Manuhaia Barcham. 2010. "Indigenous-Inclusive Citizenship: The City and Social Housing in Canada, New Zealand, and Australia." *Environment and Planning A* 42, no. 2 (February): 314-331.
- Watson, Vanessa. 2009. "Seeing from the South." *Urban Studies* 46, no. 11 (October): 2259-2275.
- Watson, Vanessa. 2002. "The Usefulness of Normative Planning Theories in the Context of Sub-Saharan Africa." *Planning Theory* 1, no. 1 (March): 27 -52.
- Yahel, Havatzelet. 2019. "The Conflict Over Land Ownership and Unauthorized Construction in the Negev." *Contemporary Review of the Middle East* 6, no. 3-4 (2019): 352-369.
- Yahel, Havatzelet. 2006. "Land Disputes Between the Negev Bedouin and Israel." *Israel Studies* 11, no. 2: 1-22.
- Yiftachel, Oren. 2003. "Bedouin-Arabs and the Israeli Settler State." In *The Future of Indigenous Peoples*, 21-47. Edited by Duane Champagne and Ismael Abu-Saad. Los Angeles: American Indian Studies Center.
- Yiftachel, Oren. 2008. "Epilogue: Studying Naqab/Negev Bedouins- Toward a Colonial Paradigm?" *Hagar Studies in Culture, Polity and Identities* 8, no. 2: 83-108.
- Yiftachel, Oren. 2006. "Essay: Re-engaging Planning Theory? Towards 'South-Eastern' Perspectives." *Planning Theory* 5, no. 3 (November): 211-222.
- Yiftachel, Oren. 1998. "Planning and Social Control: Exploring the Dark Side." *Journal of Planning Literature* 12, no. 4 (May): 395-406.
- Yiftachel, Oren, Ravit Goldhaber and Roy Nuriel. 2009. "Urban Justice and Recognition: Affirmation and Hostility in Beer Sheva." In *Searching for the Just City*, 120-143. Edited by

Peter Marcuse, James Connolly, Johannes Novy, Ingrid Olivo, Cuz Potter and Justin Steil.
London: Routledge.

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Feudalism in the Age of Neoliberalism: A Century of Urban and Rural Co-dependency in Lebanon

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Abstract

The urban and rural co-dependency in Lebanon has been drastically transformed and further heightened since the joining of both territories with the Declaration of Greater Lebanon on September 1st, 1920. The lack of any formal planning during the past century has driven socio-political and economic forces to shape or disfigure the built environment. Historians, geographers, and urban planners have addressed Lebanon's urban-rural divide by highlighting unequal development. Even still, a comprehensive overview of key historical moments that investigates migrations and the economic system is needed to understand the current co-dependent and conflicted relationship between both territories. Accordingly, this paper explores the urban and rural dynamics starting from the early nineteenth century to modern-day Lebanon, by juxtaposing the flow of migrations between Mount Lebanon and Beirut with the country's neoliberal economic policies. This analysis is derived from historical books, articles, and theses on the region and aims to highlight the integration of the rural feudalist-sectarian structure with the hyper-financialized urban neoliberal system.

Keywords: Beirut, Mount Lebanon, Migrations, Neoliberalism, Feudalism

Introduction

A century since the establishment of modern Lebanon, the Middle Eastern country by the Mediterranean has yet to witness a comprehensive planning of both its urban and rural territories. The lack of formal planning has allowed sociopolitical and economic forces to take hold of and morph the built environment. Accordingly, the urban-rural divide in Lebanon highlights a context where the absence of state development initiatives has allowed migrations and the banking system, through the influx of people and the flow of capital, to merge both territories into a co-dependent entity. Although articles (e.g., Khamis 2018; Salloukh 2017) and reports (e.g., *UNDP Strategic Plan 2018–2021 2017*; *Habitat III National Report 2016*; Harb el-Kak 2000) have highlighted Lebanon's urban-rural divide by addressing their unequal development, a comprehensive overview of key historical moments that investigate migrations and the banking system is needed to understand the current co-dependent and conflicted relationship of both territories.

At decisive historical moments, starting from the late nineteenth century, the flow of people and capital contributed to this territorial co-dependency. This reality

was exacerbated during the Lebanese Civil War (1975 to 1990), further influencing people's perception of and relationship with both areas. In post-war Lebanon (1991 to present), both the urban and the rural have been places of contention. The urban has been associated with sudden eruptions of street warfare, a failing infrastructure, and intolerable density as a result of internal and cross-border migration. Similarly, the rural has been associated with the Syrian and Israeli occupations, abandoned villages, and a space of lawlessness.

These realities are an outcome of years of civil violence that began as a sectarian power struggle and transformed into an elitist battle to control the financial networks of the city and subsequently the country. Following the Lebanese Civil War, conservative values associated with rural sectarianism, feudal authority, and libertarianism have seeped into the urban fabric and expropriated the financial tools of neoliberalism. This fusion not only brought rural feudal lords into the city and integrated them into the political bodies of the state; it transformed the economic structure and political culture of the entire country to closely reflect the gross inequalities of the rural feudalities. These transformations not only rendered the state as a tool for oligarchs, but forced waves of mutations onto the urban and rural fabric.

This paper explores the relationship between urban and rural from the early nineteenth century to modern-day Lebanon, the flow of migrations and demographic changes, and the financial systems that shaped both territories. The urban-rural divide is blurred by the integration of the rural feudalist-sectarian structure with the hyper-financialized urban neoliberal system.

Origins of the urban-rural relationship

Despite the layered ancient histories of the region, Lebanon's territorial boundaries and its conception as a nation-state began to emerge in 1861—a year after the 1860 civil conflict in Mount Lebanon between the Druze and Maronite Christian communities. The uprisings were not a simple outcome of sectarian conflict, but were a product of local Christians disobeying the Maronite Church, Druze feudalist families, and traditional demarcations of rural territories. This was caused by the economic autonomy obtained by the peasant Christian population with Beirut's introduction of a cash crop system into rural territories. The massacres that ensued generated an exodus of Christian refugees fleeing to Beirut (Kassir 2011, 90–91).

Following these events, the European powers found an opportunity to pressure the Ottoman Empire into reorganizing the governance of the mountains as a privileged administrative region overlooked by a Christian Ottoman governor (Salibi 1988, 16). The meeting between representatives of European powers and the Ottoman Empire was initiated by France and held in Beirut on June 9, 1861. Thus, the *Règlement Organique* marked the beginning of the formation of a nation that was triggered by conflicts in rural Mount Lebanon. The outcomes of the *Règlement* were decided upon in urban Beirut, an independent governorate and the future capital of the Republic of

Lebanon. The contents of this *Règlement* were negotiated by France, which annexed both territories to create Greater Lebanon in 1920, loosely delineating the national borders of modern-day Lebanon by 1926 (Ibid., 17).

These developments in the late nineteenth and early twentieth centuries initiated the interconnected yet conflicted rivalry between the urban and rural. This relationship was at times exacerbated by internationally-backed, local sectarian and feudal strongmen and at other times transcended differences through shared economic interests. The interplay between both territories could be best understood demographically and economically.

The Mount Lebanon mountain range stands parallel to the Mediterranean coast, spanning 170 kilometers of Lebanon's north-south length. Historically, the mountains were primarily inhabited by Druze and Christians and have been marked by phases of internal unequal development between both sectarian communities and among the ruling powers and masses. During Ottoman rule in the 1840s, Druze Sheikhs, described by political scientist and historian Fawwaz Traboulsi as "quasi-feudal lords," ruled over the predominantly Christian peasant population who were required to pay taxes while their Druze counterparts benefitted from exemptions. Following decades of political upheaval and shifting regional forces, by the end of the nineteenth century the lands of Mount Lebanon were mainly owned and controlled by the Christian Maronite Church and prominent feudal families. These included the Khazin and Hobeiche Christian clans in the north and the Jumblatt Druze clan in the south, which governed over a total of 100 mostly Christian villages (Traboulsi 2007, 16).

Christian Maronite peasants began to benefit from these territorial, commercial, and financial developments. However, citing the evolution of the silk industry as an example, Traboulsi explains how the road towards a more profitable existence for peasants was a slow process: "90 percent of the silk harvest in Mount Lebanon was appropriated by the emirs, sheikhs, monasteries, middlemen and Beirut merchants and usurers, leaving to a population of some 300,000 people no more than 10 percent of the product of their toil." (Ibid., 17). Highlighting the extreme inequality of the feudalist system of Mount Lebanon, Traboulsi elaborates on the trade exchanges between economically interdependent regions. He points out Mount Lebanon's role, not merely in exporting raw silk, but in acting as a key route for regional imports and exports from Iraq, Syria, and Palestine:

The Christian artisanal/commercial towns lying at the intersection of commercial routes or linking the interior to the exterior were the vital nodes in this network. Progressively, they came to control an ever-expanding space of villages and farms and sap the foundations of muqata'ji [feudalist] power on which they depended. The lords – and not only the peasants – became more and more financially dependent on the towns and cities and indebted to their merchants and moneylenders (Ibid., 19).

This transition of power from the countryside to the city was also triggered by Beirut's growth as one of the most prominent port cities in the Eastern Mediterranean and into a significant administrative hub within the Ottoman Empire. Beirut underwent major infrastructural improvements to facilitate the Empire's needs, including the centralization of power and integration with the European market (Ibid., 52). This was reflected spatially in the expansion of the city's port, linking of Damascus Road to the city, introduction of gas and electricity, establishment of a business center, and construction of a railway station, in parallel to the founding of American and French schools and universities by missionaries (Davie 2011, 48).

These internal economic developments, including Europe's interests in the region and the Ottoman Empire's aspirations to modernize its territories, weakened the power of feudalist families but did not altogether abolish them. Members of these families "were recycled into the administration" (Traboulsi 2007, 48) in the form of legalized sectarianism, first in Mount Lebanon and then in Beirut. Their position of power was continuously reestablished through demographic expansions of their respective sectarian communities. To outline the gradual merging between the feudal-sectarian and modern neoliberal systems it is necessary to study the cyclical rural and urban migrations in Lebanon's modern history.

Migrations

The proximity of Mount Lebanon to Beirut and instability of the region provoked waves of migrations. Demographic changes between urban and rural territories substantiated sectarian power and enabled the strategic handling of politico-economic national resources. As mentioned above, the founding of the Republic of Lebanon was made possible through the annexation of the countryside to the city. This resulted in a powerful demographic shift to a Christian majority that was facilitated by their control of the silk industry and trade as well as European powers' interest in establishing a Christian foothold in the Middle East.

To further understand the factors that propelled feudalist lords to join the neoliberal system, two key forces of change need to be examined: first, the migratory movements between urban and rural territories throughout key historical moments; and second, the historical politico-economic and financial forces that caused or were results of the demographic changes in the region.

Migrations under the Ottoman Empire

Migrations during the Ottoman rule were caused by sectarian conflicts in rural areas that led to the urbanization of Beirut. Starting with the late nineteenth and early twentieth centuries, the presence of European consuls and harbor of Beirut gave refugees a sense of foreign protection as well as a means to possibly migrate to Europe, North and South America. Between 1860 and 1914, 45 percent of Mount Lebanon's approximately

500k predominantly Christian inhabitants had migrated (Fersan 2010). Between 1915 and 1918, with the famine of Mount Lebanon, an estimated 200k—approximately one-third of the population—were killed leaving the rural entirely impoverished (*World War One: Beyond the Trenches* 2014).¹ As living conditions worsened in the mountains towards the end of Ottoman rule, the urban fabric was further diversified as Beirut became a focal point for migrants arriving from across the Ottoman Empire (Kassir 2011, 115–116). Traboulsi further elaborates on this multiplicity and development writing:

The absence of strong artisan guilds greatly helped the unhindered development of Beirut's international trade and services sector. On the other hand, internal migration was an important factor in diversifying the city's economic activities and helped to create a plural urban society characterized by fluid social mobility (Traboulsi 2007, 56).

The most significant transition during this period was in Mount Lebanon, from fiefdoms² to a territory entrenched in sectarian power struggles. The refugees, fleeing from internal conflicts of the Mountains to Beirut, transplanted sectarianism into the heart of the urban fabric.

It was during this era of exponential demographic growth and urban expansion beyond the confines of the ancient city that the old city's walls were demolished and never rebuilt. Immigrants from Mount Lebanon were not the only asylum seekers: Armenians escaping a genocide, Kurds from Anatolia, and Assyrians and Chaldeans from Iraq all found a safe haven in Beirut.

Migrations under the French Mandate

In 1920, under the rule of the French Mandate, Beirut and Mount Lebanon were annexed to form Greater Lebanon. Rural to urban migrations accelerated urbanization and transplanted sectarian enclaves to Beirut. Similarly, neighboring villages shifted their economies from agriculture to services in order to meet the demands of the growing urban population. Beirut's population had grown to an estimated 120k, 30 times more than the beginning of the nineteenth century (Traboulsi 2007, 56). Furthermore, Davie explains how political and demographic changes, such as the direct French rule followed by the confessional system that divided government positions on the basis of religious communities as well as the first official census to date in 1932, gave Christians the numerical majority. This tilted the balance of power back in favor of Mount Lebanon. According to Davie, this transformation was detrimental because shifting power to the inhabitants of Mount Lebanon caused rampant corruption throughout the country:

1 *World War One: Beyond the Trenches*, "WWI: The Famine of Mount Lebanon," reported by Carin Torbey, graphics by Chris West and Charlie Newland, aired October 24, 2014, in BBC Two, 2014 <https://www.bbc.com/news/av/world-29719542/ww1-the-famine-of-mount-lebanon> (accessed on January 23, 2019)

2 Ruled by Feudalism, where select noble families rule territories.

Because of a heavy-handed French presence, the Beirut municipal government was reduced to simply managing basic urban services, while real decisions were made elsewhere. At the same time, Beirut was perceived by the new elites as a source of wealth for their impoverished mountain communities. The city and its port provided new jobs for extended family and village neighbors. Direct and indirect corruption became rampant, as the new elites used their access to the workings of the city and the port to buy political favors (Davie 2002, 161).

Declaring Beirut as the capital further attracted rural refugees, causing urban sprawl and hasty uncontrolled expansion. Davie examines the consequences of this growth on rural villages. For example, feudal land-property structures further shifted former political powers, causing a decline in farming and transforming the rural workforce from an agriculture-based to a service-based economy in order to cater to the wealthy urban population that owned multi-locational houses in the city and country. The proximity of Beirut to Mount Lebanon and availability of road networks and cars made the Lebanese population highly mobile. The transfer of people, goods, services, and ideas transformed the rural landscape (Davie 2002, 162). This trend soon became common among the wealthy and middle classes, spreading urban services in Mount Lebanon and beyond (Kassir 2011, 304).

However, as the exodus to the city continued, the French Mandate struggled with the consequences of unplanned expansion, such as accommodating large masses of rural immigrants. A lack of proper infrastructure led to extreme poverty in the suburbs of Beirut and within the capital. These overpopulated areas had strong religious homogeneity and a rigid territorial delineation. For instance, the neighborhood of Basta is almost entirely Muslim while the neighborhood of Gemmayzeh is populated mostly by Maronite Christians (Kassir 2011, 297–299). Kassir explains:

In all these neighborhoods the collective dispositions that the immigrants brought with them from their homelands were found on a smaller scale, through family, clan, and village ties. Sometimes an entire village was reassembled on the same street. As in the nineteenth century, a view of the world and a set of social practices that had been formed in the countryside were transferred almost without modification to the city, [...] the importation of rural ways of thinking into an urban environment nonetheless strengthened sectarian attachments (Ibid., 300).

Migrations during the Independent Republic of Lebanon

Following the independence of Lebanon in 1943 and the expulsion of Palestinians in 1948, the growth of the city was further expedited. Unhindered rural to urban migrations led to a hypertrophy of the urban center and to the urbanization of rural villages surrounding the city. Four Palestinian camps with rural organizations were established within Beirut. Wealthier Palestinians resided in Beirut's financial district in Hamra, taking on an active role in businesses (Davie 2002, 163).

The following years were marked by unprecedented economic growth. This was largely due to the industrialization of oil excavation and exportation from the Arabian Peninsula in the 1940s. Additionally, the creation of the state of Israel in 1948, which blocked Arab countries from accessing the port of Haifa, ended the competitive role of a major commercial rival to the port of Beirut. Consequently, within a span of eight years, the port of Beirut witnessed a 27-fold increase in cargo (Kassir 2011, 355). The dissolution of the Syrian-Lebanese customs union in the 1950s gave way to new trade relationships with Jordan, Iraq, and Saudi Arabia (Ibid., 345). Beirut during this period became a vital transit for oil-producing countries in the Arab world—through its port in shipping petroleum and circulating goods, its airlines in circulating people, and its banks in circulating capital, specifically petrodollars (Ibid., 357). These developments led to the growth of the tourism sector, which was not only concentrated within the city but spread towards the countryside.

Economic growth further extended urbanization along four major roads: Damascus road, today's Independence Street, Antelias-Bikfaya Road, and today's Zouk Mosbeh-Ajaltoun Road. These are the major arteries that connect Beirut to the rest of the country, emanating from the city center and running towards the north, south, and east. Villages along these axes became points of urbanization within the rural landscape of Mount Lebanon (Ibid., 400–401).

Rural areas gradually encountered urbanization. By the 1950s, the city had exploited its *laissez-faire* economic system for an uncontrolled and unplanned construction spree. This resulted in the growth of the city's area from 626 hectares in 1945 to 2730 hectares in 1955 (Ibid., 412). Attempts at urban planning were ignored because the strict regulations of development required to implement such plans were in direct conflict with the hugely profitable, unregulated development taking place throughout the country at that time. This trend had an enormous impact on national demographics. In 1950 approximately 67 percent of the Lebanese population lived in the countryside whereas in 1975 70 percent of the population lived in cities, with Beirut carrying 42 percent of total urban inhabitants. One-third of Lebanon's population worked in Beirut during the day (Ibid., 427–430). Beirut's banking system, which gave Lebanon its label *La Suisse du Moyen-Orient*, established itself as the central industry of the country and also the locus of financial operations in the Middle East, specifically to transit petrodollars from the Gulf to the West and vice-versa. In a paper published in 1978, author and editor of MERIP³ Salim Nasr warns:

Under the impact of the increasing integration of the Lebanese economy into the world market, manifested in the hegemony of the financial and commercial sectors linked to Western capital, the Lebanese rural world has been entering a stage of decomposition and permanent crisis. The relative share of agriculture in the Lebanese economy decreased from 20 percent of the GDP in 1948 to 12 percent in 1964 to less than 9 percent in 1974.

The share of active population working in agriculture has diminished noticeably from 48.9 percent in 1959 to 34 percent in 1964, to 18.9 percent in 1970 (Nasr 1978, 8).

According to Nasr, this unequal development “produced very serious distortions and the hypertrophy of a city, a sector and a small minority at the expense of the rest of the Lebanese society. This has specifically contributed to the process of rural disintegration” (Ibid., 12). The golden era of capitalism brought an end to rural agrarian life.

Migrations during the Civil War

As Beirut grew in area and population, and Mount Lebanon’s villages were gradually urbanized, other urban and rural regions in the country benefitted from remittances. From the end of the Second World War until 1975, Beirut had become the center of regional economic and political life. The open economic system also translated into unequal development and the rise of multiple local and foreign political ideologies that reflected various dogmas, including Arab Nationalism, Communism, Fascism, Liberalism, and Lebanese Nationalism. Beirut was transformed into a seat of intense debates. Economic, political, religious, regional, urban, and rural identities all collided within the heart of the city. Its cafes, theaters, and universities transformed into agoras, its streets into platforms for political demonstrations. These disputes and collisions eventually morphed into extremism and violence.

The Lebanese Civil War erupted in 1975 in Beirut. Its physical outcome was the demarcation line known as the Green Line that separated the leftist predominantly Muslim west from the right-wing predominantly Christian east. Migrations during the war were triggered by conflict. The urban population of East Beirut found refuge or returned to villages in Mount Lebanon, further urbanizing the rural. Whereas, Lebanese escaping conflict in South Lebanon found refuge in West Beirut, a region that witnessed urban sprawl within months. Urban street warfare capitalized on former luxury high-rise buildings to gain strategic leverage over opponents. The port was looted, commercial areas were burnt, and the largest recorded bank robbery in history devastated, within a year, the reputation that Beirut had established over a century. The Green Line followed the Damascus Road’s delimitation, and the four axes that previously spread urbanization to the rural outskirts of Mount Lebanon now spread violence throughout the country. Within a matter of months, civilians seeking to flee the conflicts of the city amounted to a momentous exodus towards rural territories. Geographer and historian Michael Davie explains:

Fleeing Israeli military operations and subsequent occupation of South Lebanon, the population settled down in the still-rural periphery of south-eastern Beirut. The consequences were spectacular: nearly all the rural activities of the general area between Chiyah and the Airport disappeared in a matter of months, replaced by hastily-built housing on state and privately-owned land; the pre-existing, built-up areas were further densified, and all open spaces disappeared . . . [The eastern part of the city] saw a large number of its inhabitants

leave for safer parts of the country under the control of local militias . . . Thus during each round of fighting, transfers of population would take place, emptying areas or filling up others (Davie 1993, 2–3).

Traboulsi substantiates this rapid exponential demographic growth, explaining that the Shiite community went from having 70 percent of its members living in the rural south to 70 percent displaced in cities (Traboulsi 2014, 22–23).⁴ This effected capital flows as territories in Beirut were divided amongst militias headed by feudal warlords and Mount Lebanon was further urbanized as businesses moved out of the city towards safer rural towns and villages. Davie explains the transformations in rural western Mount Lebanon:

The traditional commercial functions in the center of the village, the local souks, would be “modernized” with the opening of video rental and clothing shops, snack-bars and garages; the grocers would often open on the outskirts, in new “supermarkets.” Agriculture, abandoned since the 1940s, would be reintroduced to satisfy local demand for vegetables and fresh produce (Davie 1993, 4–5).

Similar to the wave of immigrants following the 1860 massacres in the mountains that led to the gradual urbanization of Beirut, over time the northern rural villages of Mount Lebanon re-populated, suburbanized, peri-urbanized, and in some cases urbanized. As East Beirut witnessed a decline in population, West Beirut on the other hand became densely populated as Lebanese, predominantly belonging to the Shiite sect escaping the Israeli occupation of the south and the Beqaa Valley, found refuge in the western suburbs of Beirut. To the south of Mount Lebanon’s governorate, battles turned into massacres signaling an active policy adopted by militias that was aimed at homogenizing the populations of regions under their control. The Damour massacres of 1976 left most of the area’s local Christian inhabitants killed or expelled, only to be replaced by Palestinian refugees who were expelled by the Israeli invasion of 1982. Similarly, the Mountain Wars in the Chouf District expelled approximately 50k Christian inhabitants, driving them towards the northern districts of Mount Lebanon. If the beginning of the twentieth century was marked by the centralization of Beirut through a combination of chain migrations⁵ and cyclical migrations⁶ towards the city, the civil war sparked a decentralization of institutions and waves of migrations towards the north of Mount Lebanon. People returned to the safety of their isolated villages and found a base in their homogenous sectarian communities.

4 Fawwaz Traboulsi, “Social Classes and Political Power in Lebanon” *Heinrich Boell Foundation - Middle East*, (May 2014): 22-23, accessed December 2, 2019, https://lb.boell.org/sites/default/files/fawaz_english_draft.pdf

5 When people migrate with the help of family members and establish a base within the city.

6 Flow of movement based on job opportunities.

As Lebanon witnessed a fundamental restructuring of its urban and rural demographic fabric, a network of banks co-owned by militias and sectarian warlords dictated the course of the conflict. Neoliberalism was embedding the key players of the war into the regional and global political economy.

The Banking Sector and its Historical Role in Sectarianism

A union between rural feudalism and urban neoliberalism began to take form, the repercussions of which still reverberate today. As sectarian conflict generated migrations that spatially reorganized urban and rural territories, the banking sector exerted its financial powers to allow rural-based pseudo-feudalist warlords to establish stronger foundations in the city's economic centers and to maintain political relevance. To expand on this phenomenon, a historical overview can clarify key incidents when the pseudo-feudal⁷ sectarian political system deepened its entanglement with the liberal economy of the modern republic.

The Early Years: 1926 to Independence

The formative years of the Republic of Lebanon designated *laissez-faire* capitalism as a symbol of its national identity and the banking system as a pillar of the country's economy. On May 3, 1926, the Constitution of the Republic of Lebanon was decreed. Michel Chiha, a Christian banker, was a key author of the first draft. The Constitution reflected his vision of a merchant republic where financial services transform Lebanon into the banking center of the Mediterranean. According to Lebanese historian Kamal Salibi, Chiha was particularly fond of reviving "the Phoenicia of the modern Middle East," recurrently citing Ezekiel (27: 3, 4, 9, 33) who describes the business acumen of the ancient seafarers inhabiting the region (Salibi 1988, 179). However, Chiha's perception of Lebanon only reflected the cosmopolitan worldview of Beirut's elite circles. Little thought was given to the feudal-like sectarian mindset of rural Mount Lebanon and the hinterlands beyond (Traboulsi 2007, 93).

By 1943, 30 oligarchs (24 Christian predominantly Maronite families and six Muslim predominantly Sunni families) referred to as 'the consortium' controlled the majority of the commercial and financial sectors of Lebanon. Their power spanned both the city and rural areas. Just as their wealth expanded, so too did their presence in the country's political life, funding "large lists of 'political feudalists'" to win elections in the rural territories (Ibid., 115–117). Thus, the Constitution, with its emphasis on a liberal capitalist identity, and the elites' need for rural feudal strongmen to win votes began to kindle an unlikely interdependent relationship between both territories.

7 The authority of the feudal families can be traced back to the Ottoman empire, whereas pseudo-feudal lords emulated the modus operandi of the nineteenth century feudal power structure during the civil war as commanders of militant groups. This distinction is necessary to understand how socially embedded this psychology of political and economic systems has become.

Liberalism and the Intra Bank crash in 1966: Prelude to Civil Conflict

The open market economy and Lebanese banking sector accommodated a growing middle class but significantly catered to Lebanon's urban elites, causing social inequalities. Between 1950 and 1970, Lebanon's banking sector had the highest growth in gross domestic product in the world, with an increase from 62 percent to 75 percent (Khalaf 2002, 163). By the early 1960s, under Fuad Shihab's presidency, Keynesian economics and classical liberalism were joined in order to invest in different sectors of the economy. This approach resembled a welfare state model (Ibid., 160–161). Shihab's focus on investing in public projects and his approach to governance through Lebanon's military intelligence service helped restrain traditional leaders and form national unity.

However, Traboulsi explains that the long-term speculative investments of the era in urban planning, construction developments, tourism, and other services led to the Intra Bank crash in October 1966. The bank managed the government's infrastructure and transactions as well as "financed elections, distributed cash gifts in the guise of loans, employed clients of Shihabist notables and paid bribes of all types" (Traboulsi 2007, 149–150). Its owner, Yusuf Beidas, was a Palestinian Christian banker who, despite having control over the country's major companies, became a victim of xenophobia (Ibid., 148).⁸ Feeling threatened by a foreigner's success and rapid ascension to power, the Lebanese oligarchs sought to liquidate the bank. The economic crisis that ensued sparked animosity between elite families and the middle class; it triggered waves of discontent about the share of political power, particularly amongst the Muslim elite who now blamed the ruling Christian majority for the country's problems (Ibid., 151–152).

The blame was evaded by 'the consortium' families and the crisis was overshadowed by the infiltration of PLO⁹ militants into the southern borders of Lebanon, successively attacking Israel and ending Lebanon's neutral stance on the Arab-Israeli conflict.

Pseudo-Feudalist Warlords Take Hold of the Banking Sector: 1975–1989

Despite the Intra Bank crisis, conflict at the southern border of Lebanon, and the Six-Day War, by 1975 there were 93 bank branches in Lebanon, 20 foreign banks (Khalaf 2002, 163), and 10 joint ventures with European and American institutions owned by members of 'the consortium' oligarchs channeling large sums of petrodollars (Hourani 2015, 4). The Lebanese Civil War marked the end of the urban elite's hegemony over banks. The Christian, Druze, and Muslim pseudo-feudal rural lords who had been

⁸ Traboulsi quotes the MP Father Semaan Douaihy who hails from a prominent feudal family from the rural northern mountains. In a xenophobic parliamentary speech in 1965 he blames illegal immigrants for Lebanon's problems and attacks Yusuf Baydas as a threat to the Lebanese, accusing him of stealing "banking secrets and sell[ing] them to the first customer for profit's sake."

⁹ Palestinian Liberation Organization.

helping members of the oligarchy in winning parliamentary elections sought to profit from the banking sector.

With the onset of the civil war, sectarian groups organized their respective militias and ventured to generate conflict and monetary turnover from the *laissez-faire* economic system, the most organized and prominent of which were the Maronite Christian Phalange Party headed by the Gemayel family and the Druze Progressive Socialist Party headed by the Jumblatt family. With the use of military power, the pseudo-feudal warlords began to collect taxes and control sources of capital. Traboulsi explains the spatial reconfiguration of formerly centralized Beirut into 10 militia-controlled territories that governed the economic and political fields and profited from illegal ports. Similarly, in Mount Lebanon, the village of Ba'aqlin replaced Dayr-el-Qamar as the economic center of the Chouf region (Traboulsi 2007, 231). Urban anthropologist Najib Hourani addresses the role of financialization in enabling war, with the most important reform signed on February 5, 1977 that liberalized the financial sector with Decree #29. He explains:

The reform's impact was profound. In some cases, the legislation enabled the further marriage of merchant and finance capital among oligarchs . . . More important, it spurred the creation or consolidation of relationships between militias and the financial sector, as second tier families, their political parties, foreign investors and established oligarchs sought politico-economic position through linkage to the purveyors of violence. By the 1980s, the most successful militias made use of alliances with and control over their own networks of financial institution in pursuit of power atop Lebanon's political economy (Hourani 2015, 6).

This allowed the rural feudalist warlords to consolidate with the financial elite, controlling and creating financial networks that witnessed an exponential growth by the 1980s with globalization and casino capitalism (Ibid.). The massive revenues generated were invested in holding companies, "the three main ones under the control of the [Maronite] Lebanese Forces, the [Shiite] Amal movement and the [Druze] Progressive Socialist Party of Walid Jumblatt" (Traboulsi 2007, 231).

With the Lebanese Civil War, finance capital expanded and contributed to economic growth. This sparked the interest of the Kingdom of Saudi Arabia, which sought to engage the thriving sector to further control the downstream flows and profits made from petrodollars (Hourani 2015, 10). Subcontractor turned developer Rafik Hariri was the ideal representative. Throughout the civil war, Hariri strove to expand his local and international financial networks by collaborating with both the Lebanese elite and the rival pseudo-feudal warlords, all the while garnering popularity amongst the Sunni sect through philanthropic works.

By 1985, Hariri had established strong ties with Lebanon's pre-war oligarchs and sought to weaken the Maronite Christian militias' financial networks (Ibid., 12). The subsequent induced bankruptcy of Al-Mashrek Bank generated a wave of insolven-

cies, including the failure of the Shiite-controlled holding MEBCO. Following the collapse of war era financial networks, the torch was passed to Hariri, who in 1989 flew Lebanese parliamentary members on his private jet to Saudi Arabia to ratify the *Taif Accord* (Ibid., 17-19). The agreement marked the end of the civil war, temporarily halting sectarian violence in the country, and simultaneously weakening Mount Lebanon's political control over the country by predominantly targeting Maronite political and militant figures.

The Taif Accord, the Financial Coup and the Reconstruction of the Beirut Central District: 1990–2004

Following the end of the war with the *Taif Agreement* in 1989, the sovereignty of the Lebanese state was stressed¹⁰ and simultaneously, paradoxically, invalidated by placing the country under “the protection” of Syrian and Saudi Arabian authority. The agreement legalized and reorganized sectarianism within the government through the transfer of executive power from the Maronite Christian president to the Sunni Muslim prime minister, symbolically preserving Christian representation for national unity (Traboulsi 2007, 244–245).

With these stipulations in place, Saudi-backed Hariri sought to safeguard his position as the next prime minister despite the Syrian regime's strong opposition. In what is described as Hariri's financial coup, the former president of the Central Bank Michel el-Khoury in collaboration with Hariri, falsely devalued the Lebanese currency despite its relatively stabilized rate. With a sudden drop from 1150 to 2830 Lebanese Lira to the U.S. Dollar, angry masses violently threatened the new found peace in the country, leading to the resignation of the Syrian-backed prime minister Omar Karame and the election of Saudi-backed Hariri in 1992 (Traboulsi 2014, 22–23). The most radical post-war transformation was to occur in Beirut.

In 1993, prime minister Hariri announced the reconstruction of the Beirut Central District (BCD). By 1994, Solidere (*Société Libanaise pour le Développement et la Reconstruction du Centre-ville de Beyrouth*), a privately-owned company that reconstructed approximately 140 hectares in the core of the city, was founded. Solidere's reconstruction projects redefined Beirut as an exclusive territory for the country's elite (Davie 1993, 4–5). With mostly banks, offices, luxury hotels, high-end stores and restaurants, and luxury housing, the privatized core no longer encouraged the heterogeneity it once possessed and marginalized the peri-urban regions still suffering from the aftermath of the war.

10 Lebanon is referred to as a “sovereign, free and independent country.” Under “Other Reforms,” this is substantiated by stressing the “disbanding of all Lebanese and non-Lebanese militias” and the “liberation of Lebanon from Israeli occupation.” However, its final clause highlights the “special relationship” between Lebanon and Syria—defining both as “fraternal countries” (*The Taif Agreement*, 1989). 40k Syrian troops remained in Lebanon until April 30, 2005. Their full withdrawal marked the end of the Syrian occupation.

Within this newly-built urban district, neither former urban inhabitants nor the rural population felt included or represented. The urban, peri-urban, suburban, and rural cleavages drastically deepened with the focus of reconstruction efforts concentrated on catering to international financial markets instead of pursuing a lasting holistic approach to develop all regions and economic sectors of the country. The strategy for developing the urban core resembled the colonial approaches previously implemented by both Ottoman and French administrations: highly centralized and controlled.

Despite these realities, the reconstruction of Beirut Central District played an important role in contributing to the thriving real estate sector in both the peri-urban and suburban territories of Mount Lebanon, with rising property speculation dependent on proximity to the city. The completion of Beirut Central District and withdrawal of Israeli troops from South Lebanon in 2000 led to a superficial revival of the urban core and rural south as returning Lebanese emigres sought to buy apartments in Beirut and Mount Lebanon's suburbs; few eventually resided within the confines of the central district or far rural mountains.

Just as the pre-war period witnessed the decline of the agricultural sector, the post-war period witnessed deindustrialization and the financialization of the economy (Dibeh 2005, 24). The post-war reconstruction boom was not sustained, yet the pegging of the Lebanese currency to the U.S. Dollar and the pegging of property through real-estate and housing finance stabilized the continuous urbanization of Beirut and Mount Lebanon's suburbs (Marot 2018). This sparked an urbanization beyond the confines of the city and into formerly rural territories as real estate and construction were proving to yield profit.

Ultimately, post-war Lebanon was marked by the entrenchment of sectarianism in the government and the financialization of Lebanon's economy at the expense of local industry.

Assassinations and the July War

Rafik Hariri's assassination on February 14, 2005 prompted the Cedar Revolution, which resulted in the withdrawal of all Syrian troops from Lebanon and reinstated the formerly exiled or imprisoned political leaders and sectarian warlords to power. The newly established sovereignty was rapidly overshadowed by the 2006 July War between Hizballah and Israel. After the 34-day war during which 1109 civilians had been killed, one million Lebanese were internally displaced. Lebanon's urban and rural infrastructure was heavily targeted, including the bombing of Rafik Hariri International Airport in Beirut, power stations, and the water pumping stations of the Litani River, which cut water from 23 villages and 10k acres of farmland (Arsan 2018, 64–66). The targeted neighborhoods in Beirut's peripheries were the same regions that had witnessed unprecedented and uncontrolled urbanization during the Israeli invasion of the south in 1982. Hizballah launched the Waad Project, which successfully rebuilt the destroyed

neighborhoods, garnering massive support in the region (*Hizbullah to Rebuild Dahiyeh*, 2007).

These developments obligated all sectarian groups and political parties to make temporary peace and form a series of unity cabinets; the most recent was formed in January 2019. However, the political systems established over the previous decades soon impeded any efforts to build a strong centralized state.

On October 17, 2019, as a result of a looming economic crisis, the urban and rural populations of Lebanon began a vast uprising calling for the end of sectarianism and corruption. In an unprecedented revolt that transcended all divisions streets were mobilized and multitudes from diverse communities joined forces. But most importantly, social media outlets exposed the financial scandals of the ruling elite, with language and visuals accessible to the masses.¹¹ The apparent corruption and mismanagement of the banking system and fears of bankruptcy prompted people to withdraw their savings. In response, banks shut their doors for an entire two weeks and thereafter imposed capital control limiting access to savings accounts. A noteworthy spectacle was unfolding: As feudal-sectarianism was threatened, Lebanon's Central Bank too was proving to be vulnerable. The feudal-sectarian system and the banking sector had united into a symbiotic bond where the failure of one would signal the failure of the other, and one would naturally come to the defense of the other. Lebanese economist, Jad Chaaban, reveals the embedded nature of both entities:

Political elites control 43% of assets in Lebanon's commercial banking sector. 18 out of 20 banks have major shareholders linked to political elites. Moreover, four out of the top ten banks in the country have more than 70% of their shares attributed to crony capital. A closer look at the "political families" controlling the banking sector reveals that 8 families control 29% of the sector's total assets, owning together more than 7.3 billion U.S. dollars in equity (Chaaban 2016, 3).

Conclusion

As explained in the paper, migrations and the neoliberal banking system blurred the urban-rural divide in Lebanon. The flow of people, predominantly rural to urban, allowed for an influx of rural communities to establish their proper sectarian enclaves within the city. Likewise, the flow of capital and control of financial networks enabled the urban elite, rural feudal families, and pseudo-feudal warlords to deepen their power over the country's political life, favoring a *laissez-faire* market to shape both territories as opposed to formal sustainable planning strategies. Both the sectarian urban enclaves with their loyalty to their villages' feudal lords and the neoliberal economic system with its tendency to concentrate wealth and power in the hands of the

11 Instagram accounts like [Lebanese.corruption.facts](#) and [daleelalthawra](#) use mappings, visuals, and both Arabic and English languages to expose crime and nepotism.

few transformed urban-rural territories to properties for real estate speculation and strategic assets for sectarian political control.

The roots of these circumstances lie in the nineteenth century. The sectarian conflict, which resulted from a feudal minority ruling over a peasant majority, spread throughout the country causing waves of migration. The history of both territories began with the French mandate annexing the rural mountains to the then recently urbanized Beirut. By the time Lebanon gained its independence, Lebanese elites were predominantly Christians who had profited from both the French presence and the free-market. Their allusion to a Phoenician identity for Lebanon greatly influenced the constitution, which envisioned the banking sector as the pillar of the economy. This was an imaginary that was relevant to the elite in Beirut, but marginalized the rural population whose work relied on agriculture and light artisanal industries. The *laissez-faire* economic system was in reality marginalizing certain sectarian groups and in general creating a significant social disparity between the ruling elite and the masses, as reflected in the highly homogenized urban enclaves that had rural spatial organizations. These unequal developments culminated in a 15-year civil war, which embedded the rural pseudo-feudal warlords into global financial networks, further funding their battles and causing mass exoduses and demographic changes. With Saudi Arabia's aim of controlling the downstream flow of petrodollars, Rafik Hariri was designated as the liaison to collaborate with rival militant leaders, pre-war elites, and gradually monopolize his position within financial networks. By the time he secured his position within the neoliberal financial networks of Lebanon, he safeguarded the balance of sectarian power with the *Taif Agreement* by shifting power from Mount Lebanon back to Beirut. His 1993 financial coup was the roadmap toward securing post-war reconstruction profits in the country, which were heavily centralized in Beirut. Thus, the rural feudal-sectarian system was embedded in urban neoliberal financial networks.

Narratives of both territories continue to be interwoven by regional ruling pseudo-feudalist families, warlords, and neoliberal elites. While urban and rural populations struggle to survive, their realities stand in strong contrast to the backdrop of the Lebanese financial system; it is a system that has created an economic bubble by pegging the Lebanese Lira with the U.S. Dollar and simultaneously running the real estate sector through speculation (Arsan 2018, 219). Rural developments of gated communities in Mount Lebanon, such as Tilal Bherfaf and Beit Misk (Ibid., 223), and continued private urban developments in Beirut's center, such as the Beirut Souks and the more recent, ongoing construction site of the Beirut Waterfront Development, are projects that best indicate the far-reaching hand of the financial market in both rural and urban territories. These regions that were formerly linked by heavy migratory flows, today, are unified by capital flows. Harvey explains:

Place formation under neoliberalism is, like the production of space an active process. It is against this background that prospects for an alternative, place-based resistance to neoliberalism have to be engaged. The circulation and accumulation of capital destabi-

lizes the “permanences”¹² of places and regions, if only because money power destroys all other kinds of community so that it itself becomes the community. Phenomena like urban growth, changing regional divisions of labor, deindustrialization, gentrification, regional class alliance formation, and the like are products of this process (Harvey 2009, 197).

As Lebanon will celebrate the centennial of the declaration of Greater Lebanon in August 2020, both urban and rural territories stand suspended in a financial stalemate. 100 years after the annexation of Mount Lebanon to Beirut, both spaces have been dissolved into a financial transaction to be divided amongst pseudo-feudalist sectarian leaders. From the unpredictable whims of the feudal lords to unstable market forces, both urban and rural landscapes face an uncertain corresponding fate.

References

- Arsan, Andrew. *Lebanon: A Country in Fragments*. London: Hurst & Company, 2018.
- Chaaban, Jad. “I’ve got the Power: Mapping Connections between Lebanon’s Banking Sector and the Ruling Class.” *Economic Research Forum*, no. 1059 (2016): 3. DOI:10.1093/oso/9780198799870.003.0013
- Davie, F. Michael. “The Emerging Urban Landscape of Lebanon,” in *Lebanon’s Second Republic: Prospects for the Twenty-first Century*, edited by Kail C. Ellis, 160. Gainesville: University Press of Florida, 2002.
- Davie, F. Michael. “A Post-War Urban Geography of Beirut.” EURAMES Conference. Warwick. November 15, 1993. 2-3. <https://hal.archives-ouvertes.fr/hal-01083151>
- Dibeh, Ghassan. “The Political Economy of Postwar Reconstruction in Lebanon.” *UNU-WIDER*, no. 44, (2005): 24. <https://www.wider.unu.edu/sites/default/files/rp2005-44.pdf>
- Fersan, Eliane. “Syro-Lebanese Migration (1880-Present): “Push” and “Pull” Factors.” *Middle East Institute*. April 19, 2010. <https://www.mei.edu/publications/syro-lebanese-migration-1880-present-push-and-pull-factors>.
- Harb el-Kak, Mona. “Towards a Regionally Balanced Development.” *UNDP Conference on Linking Economic Growth and Social Development*. Beirut. January 2000. <http://www.undp.org.lb/communication/publications/linking/Session4.pdf>.
- Harvey, David. *Cosmopolitanism and the Geographies of Freedom*. New York: Columbia University Press, 2009.
- “Hizbullah to Rebuild Dahiyeh.” *Ynetnews*. May 26, 2007. Accessed February 20, 2019. <https://www.ynetnews.com/articles/0,7340,L-3404566,00.html>.
- Hourani, Najib. “Capitalists in Conflict: The Lebanese Civil War Reconsidered.” *Middle East Critique* 24, no. 2 (2015): 137-60. doi:10.1080/19436149.2015.1012842.
- Kassir, Samir. *Beirut*. Berkeley, CA: University of California Press, 2011.
- Khalaf, Samir. *Civil and Uncivil Violence in Lebanon: A History of the Internationalization of Communal Conflict*. New York: Columbia University Press, 2002.

12 David Harvey explains the word “permanences” as the “absolute spaces with an internal ordering” in his book titled *Cosmopolitanism and the Geographies of Freedom* (191).

- Khamis, Reem. "Urbanization in Lebanon: A Problematic Local Issue, Reflecting Global Trends" *Annahar*, October 10, 2018. <https://en.annahar.com/article/877425-urbanization-in-lebanon-a-problematic-local-issue-reflecting-global-trends>.
- "Lebanon: Habitat III National Report." United Nations Conference on Housing and Sustainable Urban Development. Quito. October 17-20, 2016. Accessed May 3, 2020. http://habitat3.org/wp-content/uploads/National-Report_LEBANON.pdf.
- Marot, Bruno. "Pegged Urbanization and the (in)stability of Lebanese Capitalism." *Executive Magazine*. October 04, 2018. Accessed February 7, 2019. <http://www.executive-magazine.com/special-report/pegged-urbanization-and-the-instability-of-lebanese-capitalism>.
- Nasr, Salim. "Backdrop to Civil War: The Crisis of Lebanese Capitalism." *MERIP Reports*, no. 73 (1978): 3-8. doi:10.2307/3012262.
- National Legislative Bodies, National Authorities. *Lebanon: National Reconciliation Accord Taif Agreement*. Taif. November 5, 1989. Accessed February 5, 2020 <https://www.refworld.org/docid/5b3e376f4.html>
- Salibi, Kamal. *A House of Many Mansions: The History of Lebanon Reconsidered*. London: I.B. Tauris, 2003.
- Salloukh, Bassel. "The Heart of Lebanon's Rural Darkness." *The New Arab*, June 28, 2017. <https://www.alaraby.co.uk/english/comment/2017/6/28/the-heart-of-lebanons-rural-darkness>.
- World War One: Beyond the Trenches. Episode 3, "WWI: The Famine of Mount Lebanon." reported by Carin Torbey, graphics by Chris West and Charlie Newland. Aired October 24, 2014, in BBC Two, 2014 <https://www.bbc.com/news/av/world-29719542/ww1-the-famine-of-mount-lebanon> (accessed on January 23, 2019)
- Traboulsi, Fawwaz. *A History of Modern Lebanon*. London: Pluto Press, 2007.
- Traboulsi, Fawwaz. "Social Classes and Political Power in Lebanon." *Heinrich Boell Foundation - Middle East*, May 2014. 22-23. <https://lb.boell.org/en/2014/05/04/social-classes-and-political-power-lebanon>.
- "UNDP Strategic Plan 2018-2021." United Nations Digital Library. New York. October 17, 2017. Accessed January 5, 2020. <https://www.iq.undp.org/content/iraq/en/home/library/sustainable-development/undp-strategic-plan-2018-2021.html>.

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Landscape Entanglements: Toward a Descriptive Project for Planning Research

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Abstract

The conceptual dyad of urban/rural has long formed the basis of the planner's description of space. However, the terms themselves are increasingly insufficient to describe the world in which we live, presenting as overdetermined and reductive signifiers. In this photographic essay, we use Google Earth satellite images to examine a series of locations where descriptors such as 'urban' and 'rural' falter against manifold, shifting, and unstable landscape forms. We draw on Henri Lefebvre's concept of the abstract spaces of capitalism, globalization, and urbanization, which he argued are dialectically produced through their interaction with landscape. However, where Lefebvre contended that abstraction instantiates in more or less discrete typological forms, we argue that abstract space only becomes intelligible under conditions of 'entanglement,' where qualities such as 'urban' and 'rural' become momentarily comprehensible at the instant we observe or describe them. In the end, holding the world still long enough to describe it reveals crucial patterns and relations, but always at a cost, always with the risk of reduction, simplification, and overdetermination. Such pitfalls are inevitable in research; however, they become all the more prevalent as the terms we use to describe the world become less and less applicable, and as the accumulation of anomalies compels us to build new models and to tell new stories.

Keywords: Landscape, Entanglement, Observation, Planning Theory, Orbital Photography

Introduction

The 'urban' and the 'rural' are two of the most powerful concepts in the lexicon of planners. Since the origins of the planning profession, these terms have been deployed to fix, contain, and describe the world, and to assign qualities to a variety of landscapes, behaviors, and built forms. The conceptual dyad of urban/rural, town/country, metropole/hinterland has long formed the basis of the planner's vision, while at the same time offering up an elegant device for the apprehension of space more generally. The persistence of this conceptual dyad has shaped the analytic frameworks of a range of disciplines since their emergence in the mid-nineteenth century, including economics (Moore 1984; Hendrickson, Muro, and Galston 2018), sociology (Andersson et al. 2009; Florida 2018), political economy (Marx and Engels 2011; Engels 1970), and planning (Boyer 1986).

Increasingly, however, the analytic framework of planning research is becoming strained by the use of these conceptual dyads. The problem is not simply that the dyad subordinates the rural to the urban (Lefebvre 1991, 234–235); it is that the terms themselves are increasingly insufficient to describe the world in which we live. Even descriptive innovations such as the ‘suburban’ or ‘third landscape’ presuppose forms defined in relation to a spatial dyad. Whether in ordinary parlance, or instrumentalized through planning methods, these terms present as overdetermined signifiers, often obscuring more than they reveal, meaning more and less than they say. They are not so much abstractions as reductions of a complex system, increasingly strained by their limitations as terms whose meanings solidified in the context of nineteenth-century Western Europe.

For this paper, we offer a selection of Google Earth satellite images depicting locations where descriptors such as ‘urban’ and ‘rural’ falter against manifold, shifting, and unstable landscape forms. Rather than developing an analytic argument and then seeking illustrations for it, we have taken a curatorial approach, capturing a range of images around which to build a descriptive framework. Description, of course, has a long and important history in the study of landscapes and built environments, from the sprawling accounts of nineteenth-century surveyors and geologists to the systematic research of Carl Sauer (1916), and from the *Annales* School of long-durée historiography (Burguière 2005) to the crucial work of cultural landscape geographers John Brinckerhoff Jackson and Donald William Meinig (Meinig and Jackson 1979). Indeed, description provides the very groundwork for analysis.

At stake in this effort are the ways in which planners deploy terms to comprehend landscapes, to make sense of the world around them, and to formulate interventions. As a normative discipline emerging out of the Western intellectual tradition, planning tends to draw on categories presumed to be universal, but that are in fact particular to European and North American contexts. Part of the legacy of this tradition is planners’ reliance on universalist terms to undergird their analyses of land use, built forms, and interventions in the physical world. However, while analysis is crucial to planning practice, the terms of analysis require periodic refreshment with rich, thickly woven description, particularly when those terms reach the limits of their descriptive power (see Geertz 1973). Thus, the work presented here comprises the speculative beginning of a longer research endeavor that will, eventually, include efforts at systematization. For the moment, it is our goal to provide immersion in a series of landscapes that challenge the urban/rural dyad.

In the following sections we build a scaffold for alternate readings of the landscapes included in the exhibition of satellite photographs. We begin by grounding the work in the theory of abstract space developed by Henri Lefebvre. Recognizing Lefebvre’s limits within the Western intellectual project, we turn to insights from recent work in urban theory that proposes a reformulation and decolonization of terms used to describe the ‘urban.’ Finally, as a way forward, we propose a descriptive project

centered on the concept of landscape ‘entanglement,’ with due attention to the utility and limits of aerial photography as a mode of looking.

The Problems of the Dyad

The ‘urban’ and the ‘rural’ enjoy a long lineage in Western societies that dates at least to ancient Greece, where the polis represented the highest achievement of civilization against the backdrop of the rustic countryside. However, modern concepts of urban and rural solidified within the Western intellectual tradition of the nineteenth and early twentieth centuries that gave rise to disciplines such as planning, architecture, political economy, and sociology (Perkin 1980; Heilbron et al. 1998; Hostetler 2012, 82–95). When Frederick Engels, George Simmel, Louis Wirth, and Le Corbusier wrote about cities, they were confident in the stability and explanatory power of terms such as ‘urban’ and ‘rural.’ Moreover, they presumed that the particularities of Manchester, Berlin, Paris, and New York would furnish abstract laws applicable to urbanizing societies generally (Engels [1845] 1950; Simmel [1903] 1976; Benjamin 2002; Wirth [1938] 2000). They did not imagine cities themselves to be stable places, but rather relied on the conceptual stability of the urban/rural distinction to make sense of the changes they saw before them. In this way, they derived conclusions about modernity, industrial expansion, the growth of cities, class relations, habitat, and planning that were in turn applied elsewhere.

Arguing against such crude modeling, Henri Lefebvre developed a theory of modernity grounded in a more nuanced understanding of spatial transformation. His work constitutes a major effort to link the ideological and material in the production of what he calls “abstract space.” In *The Production of Space*, Lefebvre defined abstract space as a signal feature of modernity, wherein the economic-productive intentionality of forms, routines, and relations are projected onto the material world of geomorphology and settlement. Moreover, he argues that these projections are not deterministic. Rather, the abstract spaces of capitalism, globalization, and urbanization are inextricable from and dialectically produced through their interaction with landscape. “Space,” he observes, “is neither a ‘subject’ nor an ‘object’ but rather a social reality—that is, a set of relations and forms” (Lefebvre 1991, 116). The spatial dimension of modernity, in other words, emerges from a set of dispersed but powerful administrative techniques for ordering cities, institutions, and everyday life that are increasingly brought under the register of capitalism.

While Lefebvre established a basis for reconceptualizing space as a dialectic of social relations, he nevertheless took the terms used to describe space (e.g., urban, rural, industrial, agricultural) as given. This left binary conceptions of landscape largely intact—not just urban vs. rural, but other operative categories in the lexicon of theorists and practitioners, such as planned vs. unplanned, nature vs. artifice, wilderness vs. settlement, industrial vs. agrarian, feudal vs. capitalist. These dyads continue to exert a strong influence over the normative spatial disciplines of planning, architec-

ture, and urban design, influencing the ways that practitioners describe, analyze, and intervene in landscapes.

From the Binary to the Planetary

Recent contributions by Neil Brenner and Christian Schmid (2015, 163–176) provide a crucial articulation of Lefebvre’s theoretical work by reframing the urban through a series of interrelated theses. First, they restate Lefebvre’s position that the urban constitutes a theoretical rather than an “empirically self-evident object,” one that describes a process rather than a bounded form. Second, drawing on the work of Manuel Castells and Edward Soja, they contend that urbanization—that is, the extension of ‘the urban’—is not reducible to the growth of the city, but rather has extraterritorial dimensions. These dimensions, including distinctive spatial practices, forms of governance, and patterns of everyday life, do not simply derive from but rather are co-productive of urban processes over time. And finally, they forward the idea that urbanization, as an uneven process of spatial development, “has become planetary.”

While a useful point of departure for current theoretical work, the ‘planetary urbanization’ approach comes with its own limitations. Chief among these is that the approach risks overdetermining the urban so that nothing escapes its ambit. Theorists working within this framework lean heavily on the word ‘urbanization’ to establish the urban as a process rather than finished form, but as Ananya Roy (2015, 813) suggests this leaves little room for a reckoning with the “constitutive outside,” that is, what is “not urban?” If the problem was once the reductive urban/rural dyad, the planetary urbanization approach subsumes the rural within the ambit of the urban. For Roy, this approach relegates the rural and the agrarian to secondary categories, and collapses other conditions such as ‘industrial’ and ‘capitalist’ into the urban (Roy 2015, 814). Such an encompassing framework runs the risk of reducing the analytic power of terms to statements of finality, so that empirical work undertaken within the precepts of planetary urbanization becomes a matter of confirmation.

Moreover, the ‘planetary urbanization’ approach does not escape the limitations created by origins of terms in disciplines such as planning, architecture, and urban design that are grounded in Eurocentric conceptualizations of the world. Indeed, as Roy asks, how far across the globe can we stretch concepts emerging out of the self-referential Western intellectual project until they begin to lose meaning? At what point do such terms begin to lose their salience as descriptors of human experience? The deployment of such concepts to describe the world has resulted in the creation of epistemologically limited understandings that tend to substitute theoretical claims for empirical analysis, account for wholes at the expense of parts, misread spatial forms and orders through Eurocentric lenses, and offer reductive conclusions rather than contingent points of departure (Radoine 2011; Roy 2011). These terms present an index of spatial imaginaries—floating signifiers that often reveal more about the observer than what is being observed.

The problem, as Kanishka Goonewardena (2018) argues, is not so much that the planetary urbanization approach presumes an all-encompassing condition; indeed, Brenner and Schmid's work can best be understood as proposing an extensivity of the urban, rather than a totality. Rather, the problem is twofold. First, we tend to misread extensivity for salience, thereby taking the spread of urbanization as an indicator of its depth of penetration and its organizational power in shaping human experience. Second, in deploying the concept of planetary urbanization, we risk foreclosing the possibility of alternative explanatory frameworks. Indeed, as Brenner and Schmid (2015, 176) observe, a "new vocabulary of urbanization is urgently required that would help us, both analytically and cartographically, to decipher the differentiated and rapidly mutating landscapes of urbanization that are today being produced across the planet."

We agree. To begin building this "new vocabulary," we need deeper empirical engagements with how the urban is made and unmade through uneven development within and across national boundaries, how the urban emerges not simply as a system in itself, but as a category of governance and prescription, and how the urban is entangled with other forms of landscape and social relations (Roy 2015, 814; Peake 2016; Zeiderman 2018). To contribute to these efforts and to expand the ambit of planning theory, we adopt the concept of 'entanglement' as a strategy for reading landscape.

Entanglement

The concept of 'entanglement' has its origins in the 1930s, in the work of theorists such as Albert Einstein, David Bohm, and Erwin Schrödinger, who first used the term. For physicists, the term describes action on the quantum scale, where characteristics of two or more particles (e.g., energy, position, momentum, spin) become linked through mutual influence. In such cases, the particles cannot be described independently, but only in relation to each other, and the act of measuring one changes the characteristics of the others, even if the particles themselves are separated by vast distances. Thus, our observations of matter are inseparable from the state of that matter; not only do observations affect what is being observed, they actively produce the reality under observation. As Nils Bohr famously said, "there is no quantum world. There is only abstract quantum mechanical description. It is wrong to think that the task of physics is to find out how Nature is. Physics concerns what we can say about Nature" (Bell 1987, 142).

During World War II, the need to conceptualize immense flows of information bolstered entanglement as a conceptual approach, and catalyzed the development of systems theory in various fields adjacent to physics, including cybernetics, computer science, neuroscience, psychology, and game theory (Pias 2016; Kline 2017). For scholars in these fields, entanglement describes open, non-linear systems where multiple, interacting feedback loops create the conditions for the emergence of new material or informational states. In such systems, the various elements become entangled, such that changes in one induce changes in others. Rather than defining stable ontological

categories (how Nature is), these entangled systems suggest contingent relational categories dependent on the epistemological framework within which they are observed (Halprin 2016, 150–160, 169–173).

From physical and mathematical sciences, the concept of entanglement spilled into social research primarily through French linguistics and social theory. In the middle- to late-twentieth century, scholars such as H el ene Cixous, Gilles Deleuze, Jacques Derrida, Michel Foucault, Julia Kristeva, and Jean-Fran ois Lyotard developed theoretical frameworks that moved beyond binary concepts to interwoven discourses, networked social relations, and communicative acts (Lafontaine 2007). Deleuze and Guattari's (1987) work in particular has been crucial for its focus on the elements of a system assembled into more or less interdependent relations, which they called assemblages. Taken together, the work of these literary and social theorists reveals the mutually constitutive relation between ideology and materiality, the ideal and the real, in the construction of social categories such as class, gender, race, nature, power, knowledge, the body, the self, and the city.

Meanwhile, the concept of entanglement took hold in geography and urban theory, largely under the influence of Marxist sociologists following Henri Lefebvre, as well as the emerging field of ecology, itself an outgrowth of the application of systems theory to biology. The work of scholars such as Doreen Massey, Nigel Thrift, Bruno Latour, Manuel De Landa, and Trevor Pinch has been particularly important in broadcasting the idea among spatial thinkers that elements of complex systems are interconnected, coeval, and mutually constitutive, and that these entanglements are grounded in epistemologies and power relations. In turn, spatial theorists have applied concepts of entanglement to a broad range of subjects, from technology and urbanism to development, trade, governance, and empire (De Landa 2000; Hecht 2011). As geographer Jennifer Houghton (2013, 2793) argues, the concept of entanglement has become crucial to the re-examination of spatial categories, shifting "interpretation away from a sense of dualism and frequently normative theorization towards a more complex and nuanced understanding of the interrelationships between the elements which coalesce to produce tangible outcomes in places."

When Lefebvre contended that abstraction is a mode of alienation in which the conceived comes to dominate the lived, he assumed that terms such as 'urban' and 'rural' would adequately describe the resultant typological forms. We argue, however, that such forms only become intelligible under observation, indicative of a social reality that remains messy and unfinished--indeed, entangled. Just as the lived and conceived are inextricably entwined, so do qualities such as 'urban' and 'rural,' 'artifice' and 'nature,' 'planned' and 'unplanned' become momentarily comprehensible at the instant we observe or describe them. After all, the complex feedback loops between economies, networks, technologies, social relations and built forms quickly overwhelm the observer. Holding the world still long enough to describe it reveals crucial patterns and relations, but always at a cost, always with the risk of reduction, simplification,

and overdetermination. Such pitfalls are inevitable in research; however, they become all the more prevalent as the terms we use to describe the world become less and less applicable, and as the accumulation of anomalies compels us to build new models and to tell new stories (Scott and Storper 2015; Simone and Pieterse 2017, 183-198).

Thus, if we accept that elements of systems are entangled, how do we describe those elements in ways that avoid reification? How do we observe entangled elements in a system without radically overdetermining that system? Given that the terms we use are increasingly inadequate to describe complex phenomena, we argue that a new descriptive project is needed in the study of landscapes and built environments. In this case, we do not need to jettison terms such as ‘urban’ and ‘rural’ so much as we need to redeploy them as heuristic and contingent, rather than normative or ontologic categories. As Chantal Mouffe argues, such terms imply constitutive outsides, but these outsides cannot be understood merely as something “asserted/negated by another content which would just be its dialectical opposite.” Rather, terms such as ‘urban’ and ‘rural’ can best be apprehended in terms of their “radical undecidability,” that is, their contingent meanings formed in relation to each other and to the observer (Mouffe 2000, 12–13, cited in Roy 2016).

Landscapes Under Observation

As we observe images of entangled landscapes, it is necessary to consider the entanglements of the very tools we deploy—in the case of this essay, the suite of products known as Google Maps and Google Earth. After all, the Google Earth operation emerges out of an entangled series of landscapes that defy ready categorization, connecting satellite launch pads with military aerospace installations with city center corporate headquarters with banal suburban office parks. Google Earth relies on images relayed to the Geospatial Intelligence Agency (NGA) in Springfield, Virginia from the Landsat 8 and GeoEye-1 orbital satellites. In this way, Google Earth assembles a vision of a “known world” from a mosaic of millions of Terabytes of mapping data gathered amid the otherwise mundane landscapes of geospatial intelligence, national security, and surveillance. We might call this landscape ‘rural’ for its setting amid former tobacco fields of the Piedmont; ‘suburban’ for its emergence alongside the curvilinear streets and cul-de-sacs of American edge habitat; or ‘urban’ for its intellectual, cultural, and political connections to Washington, DC. It may be all of these things, entangled with a wide range of other landscape forms across the world; the point is to describe and understand them so that we can build new theory.

Of course aerial and satellite photographs only provide a partial view of the world. Beyond the obvious diminution of species life and activity and the privileging of the visual over other sensory modes, vertical views also flatten topography and distort the Earth’s curvature. Moreover, projects such as Google Earth pretend to a pristine, smooth, “god eye” view, but in fact present visual data stitched together by algorithms using visual data captured during multiple passes of several satellites (Dial et al.

2007; Dorrian 2013, 290–293; Kurgan 105–120). After all, while Landsat 8 and GeoEye-1 capture data on a 16-day Earth rotational cycle, Google acquires and displays images selectively, so that the resultant atemporal mosaic is comprised of tiles created across a wide range of dates (Roy et al. 2014, 156).

Nevertheless, these aerial views are useful in that they cannot help but expose a world of intertwining spatial forms, comprised of iterative, ever-shifting composites of the material and the ideational, the abstract and the concrete. Satellite imagery provides an important tool for descriptive and analytic research, since it reveals forms that can be difficult to fathom on the ground, but that exert a powerful organizing force on everyday life and spatial experience (Heathcott 2019, 32). The view from above throws particular elements, assemblages, and relations into relief, providing important insights into landscape forms as they change over time.

Entangled Forms

What, then, are the elements under observation in this project? To bring a measure of coherence to our reading of images, we provide some definitions of content. Most of these terms will apply in one way or another to most of the images. For example, nearly all landscapes are extractive in one way or another, whether through realizing ground rent or netting fish from an estuary or transposing nitrogen from soil into crops or digging out minerals from the earth. However, we are interested here in the more or less predominant modalities of landscape form that appear in each satellite photograph. Our paratactical list of terms includes the following:

Bespoke. A bespoke landscape is one that has been custom designed and engineered over a relatively short period in order to perform a highly specific function. These functions may include but are by no means limited to leisure, entertainment, science, industry, incarceration, containment. It may incorporate modular elements, but the way in which these elements are assembled can be unique.

Colonial. All landscapes take form through relations of power. We use the term ‘colonial’ here to refer to landscapes that clearly reflect the imposition of political, economic, and epistemological power by one national or ethnic group over another. Often this emerges in episodes of cross-territorial invasion or occupation, but may also come about through ethno-racial dominance within states.

Cultivation. Cultivation landscapes are those devoted to the production of food and other resources. These include farms, fisheries, timber stands, pastures, ranges, and other forms. Such landscapes take a wide variety of forms across the planet. Agrarian landscapes, for example, include smallholder kitchen gardens and family orchards, monoclonal plantations and industrial farms. They are imbricated within a range of political, economic, and social relations that may be entangled with, but not always reducible to, capitalism.

Diagrammatic. A diagrammatic landscape is one that goes beyond merely being highly organized or comprehensibly planned. Rather, it evinces a formal, architectonic, indexical design, one that stands in dramatic contrast to its surrounds while signaling modes of power and control. Sometimes a diagram is singular, such as the nonagonal shape of Palmanova, Italy. Other times, the diagram functions like a cartouche, a form containing other forms, such as World's Fairs and theme parks.

Extractive. While agriculture and property are both extractive processes, their modes of extraction tend to be more diffuse, subordinated to other purposes such as the provision of shelter, the plantation of staple crops, and the reproduction of labor. We use this term in this essay to refer to landscapes dedicated singularly to resource extraction, such as mining, fishing, and data harvesting.

Gridded. The concept of the grid has a long history in planning, architecture, and other spatial disciplines. From the Roman camp to the Law of the Indies settlements in New Spain to the U.S. Township system, the grid constitutes a powerful locus of control over land by state authority. Grids are abstract spatial orders: some remain invisible, such as navigational systems; others take material form through human settlement, cultivation, and building.

Industrial. The extension of industrial space and time to multiple locations constitutes one of the most crucial factors shaping the world today. By industrial, we refer to a system wherein factors of production are broken into repeatable tasks performed in linked chains by interchangeable laboring bodies and machines. Like the 'urban,' industrial factors may be less visible or tangible; we use the term here to refer to industrial functions that directly shape landscapes.

Isolate. A spatial isolate is a landscape form that is significantly disconnected from its surroundings, whether geomorphically or through engineering and design or both. Very often an isolate performs a singular or highly dominant function, such as the Federal Penitentiary at Alcatraz, a prison located on an island in the middle of the San Francisco Bay, or the nuclear waste disposal sites that dot the planet.

Logistical. Logistical landscapes are most closely related to Lefebvre's concept of abstract space. Here, we use the term to refer to highly engineered landscape forms dedicated to controlling the flows of information, materials, goods, and people. These landscapes often serve as key nodal points in chains of extraction, refinement, transportation, production, assembly, inventory, storage, and consumption.

Macroform. This term refers to a landscape that results from the contiguous repetition of a form or combination of forms at scale. It can refer to city-making processes of subdivision and development, where individual properties in a grid of streets push outward in fits and starts from the urban core. It can also refer to a specific kind of agricultural unit replicated

over and over, resulting in a relatively uniform agrarian landscape. In any case, as with similar terms such as ‘urban sprawl,’ the content of macroform must be described.

Metropolitan. Despite its troubled origins in colonial discourse, the term ‘metropolitan’ remains useful as a way to describe the conditions created by the projection of urban macroform into regional space. Often misread as an object, the metropolitan is less a definition of a specific landscape typology than a description of relations among people, networks, and systems created by the uneven expansion of landscape forms.

Modular. This term refers to elements of landscape comprised of repeatable, interchangeable forms. Like the logistical, the modular relates closely to Lefebvre’s notion of abstract space, in that it may be conceived in one place under a particular circumstance, and subsequently deployed in multiple spatial-temporal contexts. Modular forms such as shopping malls, dams, office parks, research laboratories, and container ports often embed power relations.

Patchwork. Unlike the grid, a patchwork results from the repetition of an irregular form across a defined space. This can be ‘urban’ in the case of the figure-ground of medieval towns and cities, or ‘rural’ in the case of feudal and kinship-oriented agrarian landscapes. The distinction between patchwork and grid forms is often misread as ‘organic’ versus ‘rational’ or ‘informal’ versus ‘formal,’ but we reject such reductive binaries. Rather, the distinctions tend to reflect different modalities of planning, collectivity, authority, and management of land.

Rhizomic. The rhizome emerges without a center and extends through a mesh of complex forms with multiple nodes of growth, so that alteration of or damage to any part does not compromise the whole. Many landscapes evince rhizomic form at the local level, but at the metropolitan or regional scale they are usually part of multinucleated systems with subtle but definite hierarchies and agglomerations.

Scientific. A scientific landscape is simply one optimized for research. The imperatives of research in the sciences often shape the architecture, engineering, and land uses wherein such research takes place. This can range from the brief for a small laboratory building to the design of a large research park or even to the mobilization of earthworks for particle colliders, weapons testing, and nuclear research. Rather than seeing these as universal expressions or techno-rational requirements, we view such landscapes as highly charged with ideological meaning.

Settlement. Any area of human habitation marked by relative proximity of people to one another, interdependent social practices and processes, and more or less fixed dwelling that endures over time. There is a nearly uncountable variety of settlement landscapes across the globe, linked closely to culture and tradition, though modified through varied

influences from near and far over time. Human settlement comprises some 3% of the planet's land surface, more than any other land use.

With these terms we have endeavored to attach relevant content to each image, while avoiding the dyad of urban and rural in our descriptions. Indeed, all of the landscapes depicted evince elements of both urban and rural forms, networks, and systems along a continuum; none of the landscapes, however, can be reduced to either urban or rural. Of course, this is only a partial and preliminary effort, not to mention one based on a very broad sweep. There are dozens if not hundreds of terms useful for landscape description. Moreover, no landscape can be understood solely through aerial, orbital, or plan views; Google Earth is just one among a suite of tools useful in the apprehension of landscape forms. Our assertion here is that the careful application of terms to descriptions of landscape constitutes a key factor in the construction of new theory and analysis that moves beyond dyadic, reductive, and overdetermined readings of landscape. Ultimately, new theoretical frameworks will provide planners with more nuanced, calibrated, and sensitive methods for intervention into landscapes and built environments.

Preliminary Observations

The photographic gallery assembled here explores landscapes through the framework of entanglement. Far from a conclusion to these issues, we provide one possible point of departure: An initial effort to look at landscapes that defy ready categorization so that we can develop a new descriptive language. We have taken a curatorial approach so that we can focus simultaneously on the landscapes depicted in the images as well as the entanglement of the images with the technologies of their production. Thus, our selection of images is purposefully non-definitive, partial, unsystematic, and fragmentary. There is no formal logic to the selection other than our interest in landscapes that defy ready categorization. After all, this piece is not an effort to analyze entanglement within the accepted terms of landscape. Rather, we offer a meditation on entanglement in landscape as a first step in building new planning theory.

The images that follow expose some of the rank inadequacies of terms we traditionally use to describe landscapes. We begin to see the shortcomings of commonplace theoretical assertions. For example, Lefebvre's (2003) claim that we live in an urban world appears woefully premature; we live in an urbanizing world, to be sure, a world of dilating settlement macroforms, but that is an unfinished project (Allain 2004). More to the point, actual landscapes complicate assertions that every patch of earth touched by technology, capital, surveillance, and communication flows is necessarily urbanizing or is *sui generis* urban. Likewise, the common view of the rural as undeveloped (Edwards 1976), as rustic pre-urbanized space, or as an absence of the urban, necessarily falls apart in the face of architectures, landforms, and mediations that spread through human settlements of varying densities (Damon et al. 2016; Irwin

et al. 2010; Lichter and Brown 2011). Finally, whatever comfort we might once have felt in conjuring wilderness as nature untouched by human hand falters before the planetary mesh of industrial and communicative technologies that increasingly connect points of the globe.

This is not to say that the urban dimensions of Sanaa or Manilla are qualitatively the same as those of Antarctic encampments or the middle of the Atlantic Ocean. The urban might concentrate in thick bundles around areas of dense human habitation that we call cities, but large-scale migrations bring rural social relations, cultural practices, and spatial traditions into those same areas, remaking them in the process. Urban forms penetrate far into rural regions and remote natural landscapes, whether through visible infrastructure and population expansions, or through invisible webs of communication, utility, and surveillance—but they are also transformed in those circumstances. Meanwhile, mass mediated representations of the ‘urban’ and the ‘rural’ extend across all settlement forms through television, film, and the internet. Ports, dams, military facilities, electrical grids, and other logistical spaces spread like rhizomes across the planet’s surface, driven by the “demand that our Amazon package be sent cross-country overnight; that fresh roses from Colombia appear at the local deli within days of being cut; and that an Uber car pick us up in a matter of minutes” (Easterling, LeCavalier, and Lyster 2016). The spaces that such demands engender are neither wholly urban nor rural, but rather projections of human technē onto varied landforms, environments, and imaginaries.

While we live in an age of rapidly multiplying connections and space-time compression, the world we are making cannot simply be collapsed into any one quality. After all, we still inhabit a very small portion of the planet. According to the Food and Agricultural Organization of the UN, little more than one half of one percent of the Earth’s land is covered by artificial materials such as pavement, housing, quarries, and open mines, while 12% is devoted to agricultural crops (Latham et al. 2014, 23). Nine out of ten people live on 3% of the Earth’s land surface, and half the population lives on 1% of the land (European Environment Agency 2015, 1). Nevertheless, the human imprint is profound. The resource shed of New York City, for example, requires an area of land at least five times its size to sustain the population. And as of 2009, the global “Human Footprint” covers 75% of the terrestrial surface (UN Secretariat 2018, 70). Industrial toxins, particulate emissions, and waste dumping have taken a significant toll on the world’s oceans, and the increasing pace of resource extraction and land degradation threatens thousands of species with extinction (ibid. 2018, xxxi).

In all cases, our reductive use of terms looks increasingly like category errors masquerading as theoretical insights. After all, there is a tremendous difference between claiming that the planet is undergoing urbanization (as one among many forces of transformation), and claiming that we have arrived to an urban world. To say that the world is ‘urban’ seems as problematic as saying that we live in a largely wild or aqueous world; such statements correspond to some qualified truth, but explain lit-

tle. Our lack of more precise descriptive capacity leads us to read complex landscapes through familiar categories, stretching their meaning to the breaking point. Over time, as planners have encountered landscapes that defy description, they have reached for terms such as ‘suburban,’ ‘peri-urban,’ ‘semi-rural,’ ‘informal,’ or ‘unplanned’—terms that only convey meaning with respect to something else.

Amid these perturbations, Lefebvre’s notion of abstract space remains a useful theoretical concept, but its skeleton must be “clothed in flesh and blood” (Lenin 1894 quoted in Lefebvre 2014), tempered perhaps by his equally important insights into everyday life and the realities of lived experience. These are not simply sites of resistance to an all-encompassing abstract space, but rather revelatory of far more varied kinds of spatial practice. After all, amid the expanding signatures of industrialization, globalization, and urbanization, Gyan Prakash (2010, xx) reminds us that people experience globally situated and connected spaces as “decidedly local lifeworlds, thick with specific experiences, practices, imaginations, and memories.” People tend to work out, on the ground, their own shared understandings of the landscapes that surround them, assigning shifting content and meaning to terms like ‘urban’ or ‘rural’ or ‘town’ or ‘country.’

In this sense, the spatial disciplines must once again take up a multi-pronged descriptive project, similar to the sprawling accounts of nineteenth century diarists, boosters, illustrators, and chroniclers. Given that the complex reality of the world presents so many anomalous, contingent, ill-fitting landscapes, a new round of descriptions should scaffold analysis and build the next generation of spatial and planning theory. Such a descriptive project could bring a refined understanding to scalar alignments and disjunctures that only basic research can obtain. Moreover, it should begin from a decolonized position, rejecting points of departure that rely solely on Western theoretical precepts. A trickle of journals has made room for descriptive work, but scholarly venues overwhelmingly privilege analysis over narrative, description, poetics, illustration, and other registers. This in turn causes many scholars to use theoretical and critical shortcuts that preclude careful description.

A new descriptive project can use aerial and satellite views to identify landscapes entangled by multiple forms, but such tools must be calibrated against the deeply problematic histories of cartography as a field of power. Nevertheless, as Denis Wood (2011, 15) reminds us, empirical description does not require the suppression of unavoidable subjectivities. The “vertical view” afforded by orbital and suborbital flight technologies provides a useful tool for identifying entangled landscapes, which can then be studied on the ground to work out how varied actors understand, shape, and contest them—actors that include not only humans, but multiple species, geomorphologies, climate patterns, and other features of the “natural” world. These grounded studies can then confirm, challenge, or articulate what we learn from seeing the world at 30,000 feet.

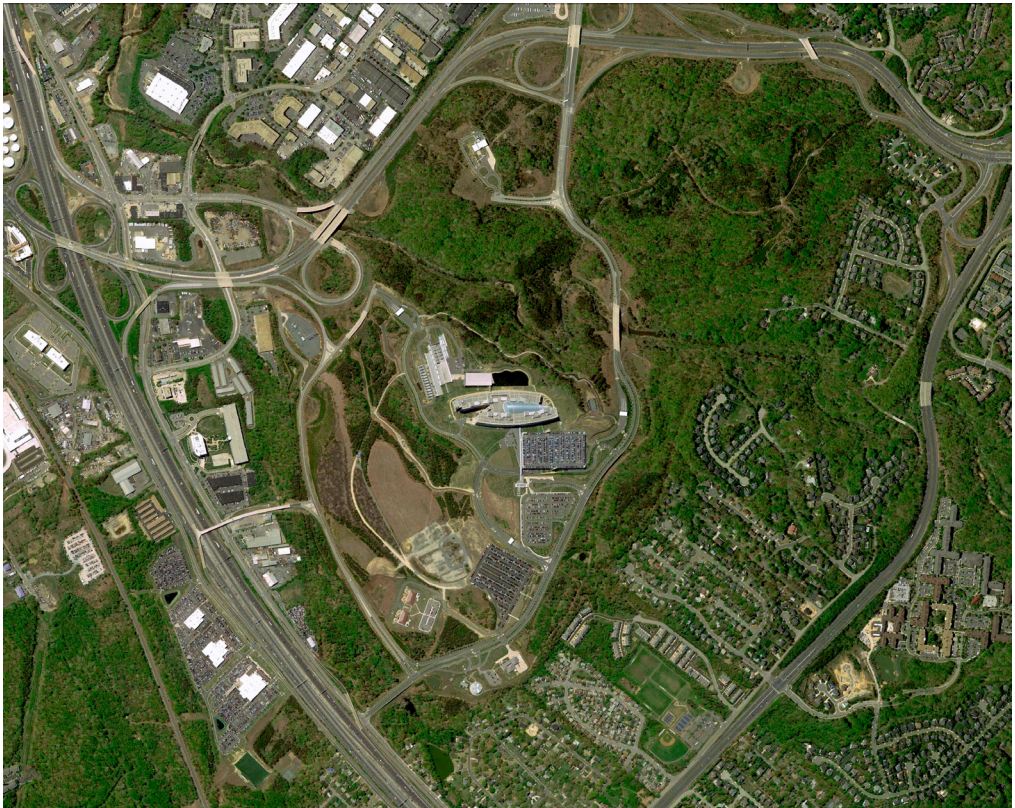
In the photographic gallery that follows, then, we use visual survey methods to identify a series of landscape entanglements. We attach keywords to each image, listing the predominant landscape form first, followed by additional terms in a diminishing order of salience. We do not use these keywords as determinants with fixed meanings, but rather as heuristics to describe the gradients and imbrications of varied landscape elements. Some of the images show edges and collisions of forms, while others show interstitial, folded, and entwined forms. However abstract their spatial codes and parameters, however embedded in systems of economy and governance, however contested through conflict and war, every landscape emerges out of grounded, specific material relations. In that sense, the landscapes depicted here are simultaneously ideational and material, phenomenal and constructed.

Many of these landscapes may seem familiar at first glance: a routine collection of elements, a recognizable architectural form, an oft-encountered substrate of terrain. But looked at closely, they may seem aberrant or strange, abnormal or discomfiting. They may oscillate between the known and unknown, or assume uncanny shapes that gain and lose resolution according to the filters we use to view them. Such landscapes defy categories, their raiment braided into knots of spatial significance, their forms bristling with functions and meanings. They are at once material instantiations of spatial modularities, flows, and abstractions, and at the same time productive nodes of worlding, reflecting back, however imperfectly or adulterated, layered social and cultural meanings as well as the inchoate projects of capital and state. Sometimes these landscapes manifest through juxtapositions of distinct spatial forms, other times through adumbrations and slippages. Still other times they are invisible, ghostly, fugitive. In all cases, they are works in progress, landscapes under constant transformation, worlds in the making.

National Geospatial Intelligence Agency, Reston, Virginia.

Set amid the interchanges, malls, and cul-de-sacs of Northern Virginia, the National Geospatial Intelligence Agency is the chief organ for the production and circulation of satellite images, including the Google Earth photograph below. The 2.4 million square foot building at the center, located on the former proving grounds of Ft. Belvoir, contains most of the mapping, monitoring, and data processing facilities. Nearby office parks house facilities for General Dynamics, Raytheon, U.S. Customs and Border Protection, the Coast Guard, and numerous security and communications companies. Meanwhile, Chipotle, Starbucks, Walmart, Costco, and other staples of bigboxia fill the surrounding shopping centers. To the east, a community of modest two-story and split-level homes spreads out along curvilinear streets in lush green parkland. The setting of geointelligence facilities amid such banal landscapes is not accidental; it is part of a long process of spatial deconcentration of military, government, and commercial “back office” operations from central city locations.

Keywords: Modular, Extractive, Logistical, Scientific, Metropolitan



Location: Latitude 38°45'13"N, Longitude 77°11'50"W, Altitude 18,472 feet.

Date: 20 April 2018 (accessed 3 April 2019).

The Graticule

The center of this image shows the zero point of the graticule, or Geographic Coordinate System, where the Prime Meridian crosses the Equator. While the Equator constitutes a natural feature of the oblate-spheroid planet determined by the distance from poles along its axis of spin, the Prime Meridian is an arbitrary designation. Indeed, the Greenwich Prime Meridian constitutes the ultimate expression of imperial power, anchoring the projection of measured space across the curved surface of the earth. This navigational machine envelops the planet in a grid of sections of varying size. At the equator, a section that measures one second by one second covers approximately 10,000 square feet: There are 233,280,000 such sections on the earth's surface. The zero point shown below is the necessary product of this spatial imaginary, located in the Gulf of Guinea approximately 400 miles south of Accra, Ghana, and 650 miles west of Libreville, Gabon. It was captured by the Geo-Eye Satellite on 30 December 2016, and is rendered here from an "Altitude" of 3,281 feet.

Keywords: Colonial, Gridded, Isolate, Logistical, Scientific



Location: Latitude 00°00'00", Longitude 00°00'00", Altitude 3,281 feet.

Date: 30 December 2016 (accessed 9 March 2019)

IRRI

The U.S. government established the International Rice Research Institute in 1960 on the outskirts of Manila as part of a “soft power” turn in foreign policy. Conceived as a weapon of the Cold War waged through the stomach, IRRI sought to win allies with the promise of ending hunger through technology transfer. Under the sign of the “Green Revolution,” IRRI pursued the erasure of indigenous and local knowledge systems and their supplanting by scientific, techno-rationalist industrial agriculture. Not incidentally, this Global North research epistemology also involved the transfer of the mundane U.S.-style suburban office park landscape, shown below, itself a product of Cold War decentralization policy. The research center, with its grid of agricultural test plots, modular buildings, and parking lots, abuts a densely patchworked vernacular landscape of orchards, kitchen gardens, pig pens, and chicken coops, all interspersed with signatures of the encroaching sprawl of Manila. The rigid line between the two landscapes conveys the sense that they are pushing against each other along the line of separation.

Keywords: Colonial, Extractive, Scientific, Cultivation, Gridded, Metropolitan



Location: Latitude 14°10' 08"N, Longitude 121°15' 16"E, Altitude 4,692 feet.

Date: 23 March 2016 (accessed 9 March 2019)

Dadaab

Located in Central Kenya near the Somali border, Dadaab is one of the largest refugee camps on the planet, with a peak official population of some quarter million people. This view shows only one part of the larger complex, a section known as Ifo Camp, laid out in 2012 to provide a catchment for the increasing flow of refugees. Since 2018, however, the Kenyan government has closed Ifo and reduced the number of refugees at Dadaab, which it perceives as a security risk. As a landscape typology, the refugee camp defies ready categorization. Located in a vast semi-arid plain, it contains densities of settlement similar to many cities. Evincing a kind of urban rigidity in its infrastructure, it is home to large numbers of people from rural regions of Somalia, Ethiopia, and Sudan. Based on a militarized grid form that has its roots in Roman camp design, residents bring their own array of spatial sensibilities and settlement preferences to the camp, and engage in complex re-working of the landscape—moving tents into clusters, establishing ‘desire’ paths, planting trees and cultivating natural fencerows.

Keywords: Settlement, Gridded, Modular, Logistical



Location: Latitude 14°10' 08"N, Longitude 121°15' 16"E, Altitude 4,692 feet.

Date: 1 February 2014 (accessed 9 March 2019)

Port Klang

The logistical space of Port Klang spreads across a series of mainland and island facilities in Malaysia's Selangor Estuary. Westport, shown below, occupies the island of Indah. Prior to the development of Westport in 1994, Indah was home to a patchwork of mangrove forests dotted by small fishing villages and farming communities of aboriginal Semang and Senoi people, most of whom were displaced by ethnic Malay and Chinese. Today, the port incorporates large-scale infrastructure for unloading containers, warehousing goods, processing customs and duties, docking and refueling ships, and disembarking passenger cruise liners and naval vessels. At lower left, the 1000-acre free trade zone, established in 2004, houses a range of corporate offices, technology and equipment companies, and manufacturing plants all geared toward transoceanic markets. Companies located in the zone are exempt from most taxes as well as fees for capital transfer. A wavering road and high fences separate the port facilities and free trade zone from a neighborhood of small houses and plots used for agriculture and home production.

Keywords: Logistical, Modular, Extractive, Industrial, Settlement, Gridded



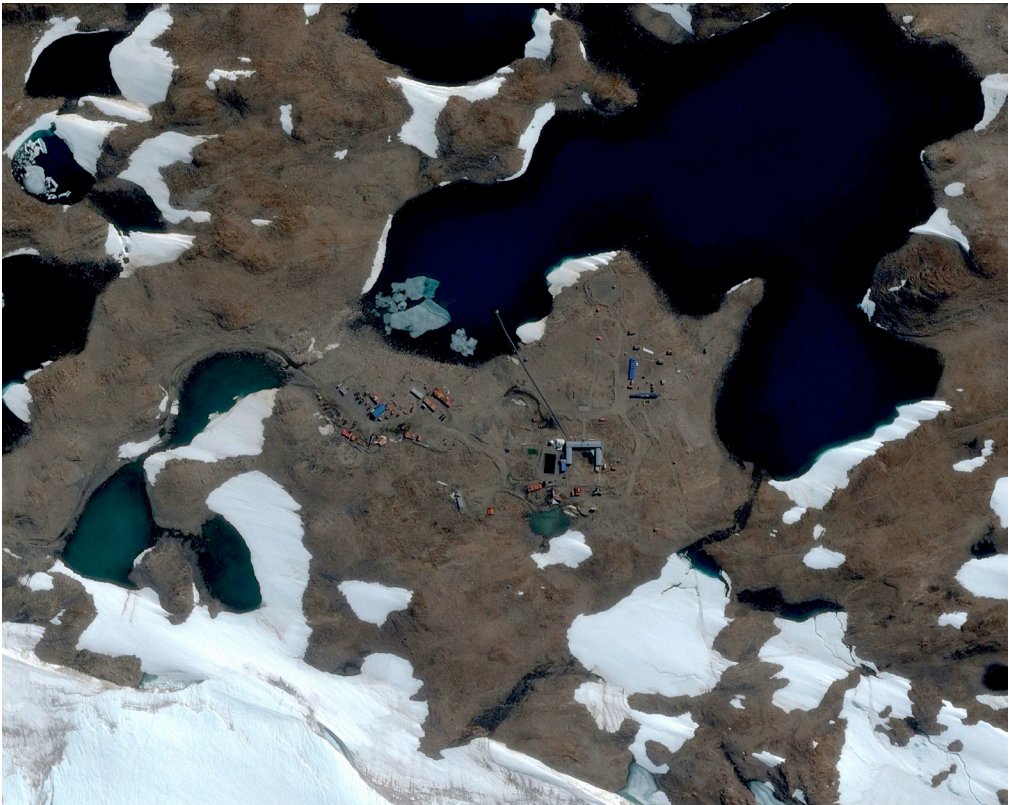
Location: Latitude 02°55'27"N, Longitude 101°17'28"E, Altitude 30,285 feet.

Date: 23 March 2014 (accessed 9 March 2019)

Maitri Station

One of three stations established by the Indian government through the International Convention on Antarctic Research, Maitri houses scientists studying a range of geologic and atmospheric phenomena. Indian military engineers located the facility at the remote Schirmacher Oasis, a landscape of elevated rocky plateaus and freshwater lakes carved out by nearby Dakshin Gangotri Glacier. The Oasis remains uncovered by snow during most of the year. In addition to storage structures, generator equipment, and a water conduit, the facility includes a large main building housing most of the laboratories, residential quarters, and offices. Today Maitri can support up to 26 scientists and staff for overwinter stays, representing numerous Indian scientific organizations, universities, and research centers. Key ongoing projects include studies of ozone depletion, monitoring ultraviolet radiation, and tracking the chemical and geomorphic signatures of climate change driven by industrialization and urbanization. The Indian government recently announced that it will replace Maitri with a new station in the next 2–3 years.

Keywords: Scientific, Isolate, Bespoke



Location: Latitude 70°45'60"S, Longitude 11°43'53"E, Altitude 6,183 feet.

Date: 20 December 2016 (accessed 9 March 2019)

Sanaa

One of the oldest continually inhabited cities in the world, Sanaa stretches lengthwise through a semi-arid valley of the Sarawat range. The city occupies a tense breakpoint between tribal alliances and the Houthis movement, between Sunni and Shiite Islam, and between the expansionist political ambitions of Riyadh and Tehran. The dense morphology of the city reflects a mix of Islamic residential and town-building principles, traditional Yemeni rammed-earth architecture that restricted the base dimensions of buildings, and a series of intersecting roadways launched by Ottoman rulers in the late nineteenth century and continued under the Zaydi imamate in the twentieth. In the image below, the Assafi'yah district on Sanaa's eastern edge forms a bright line against a steep escarpment crisscrossed by mountain trails and seasonal watercourses. The monochromatic tint indexes the materiality of the landscape out of which the city emerged, both in terms of the earthen resources used to build, and the high particulate drifts from the surrounding mountains.

Keywords: Settlement, Macroform, Patchwork, Rhizomic



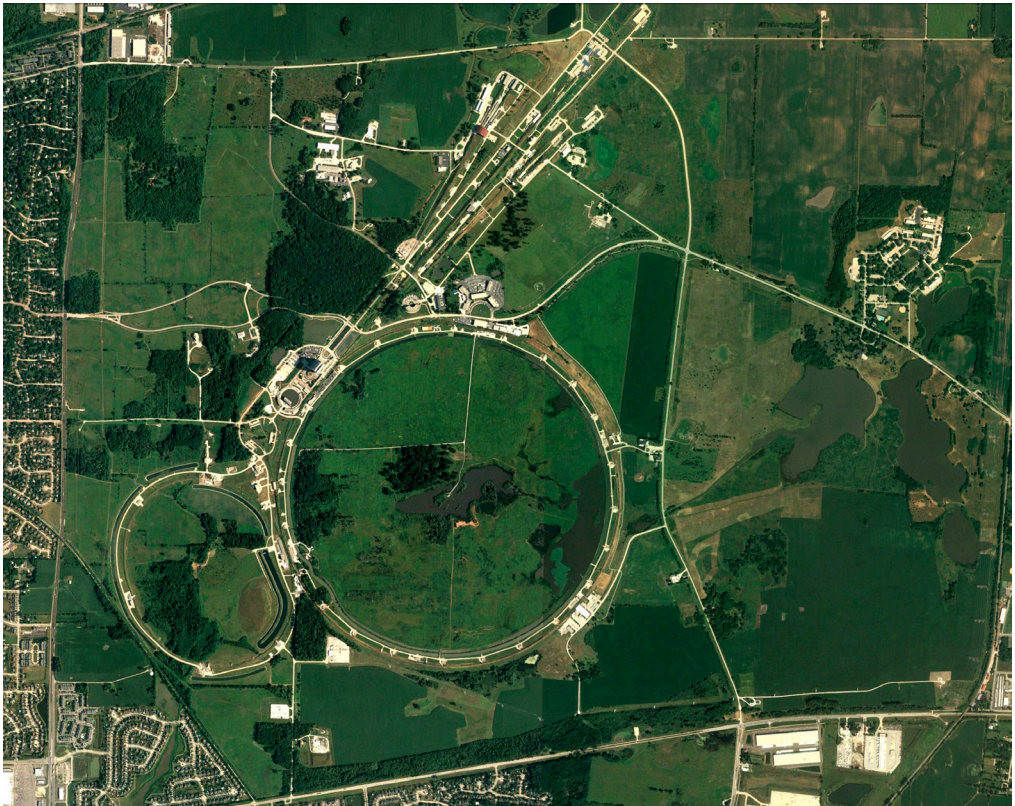
Location: Latitude 15°20'01"N, Longitude 44°13'45"E, Altitude 16,182 feet.

Date: 16 December 2018 (accessed 9 March 2019)

Fermilab

Built in 1967 in Batavia, Illinois, the Fermi National Accelerator Laboratory occupies 6800 acres of former prairieland, now surrounded by farms, golf courses, and subdivisions. Created to advance particle detection capacity, it has the capacity to accelerate protons to 99.999954% of the speed of light. Throughout the 1970s and 1980s, Fermilab played a major role in the refinement of nuclear weapons technology. Much of the apparatus is buried or housed in low-rise structures, woven together through a bestiary of mechanical systems, from vacuum pumps and injector tubes to booster rings, beam position monitors, magnets, and a vast thicket of water, electric, and cryogenic conduit. The circular forms of the Main Injector Ring (left) and the Tevatron particle accelerator (center) echo the numerous cul-de-sacs in the nearby streets with names like Woodland Hills Road, Clover Court, Lake Spur Lane, and Pine Street. The expanse of former prairie once occupied by Illinewek, Macouten, Kickapoo, and Shawnee people, was reconfigured to support the development of weapons of mass destruction.

Keywords: Bespoke, Scientific, Diagrammatic, Metropolitan



Location: Latitude 41°50'09"N, Longitude 88°14'52"W, Altitude 24,632 feet.

Date: 27 June 2009 (accessed 9 March 2019)

Cunene Basin

Tucked into a valley between the Sierra Chilengue and the high Bié Plateau, the Cunene basin in Huambo Province, Angola is part of a great watershed fed by three rivers, the Cunene, Etembo, and Cunhangamua. With the construction of the Gove dam, seen at bottom right as an elegant grey arc, the basin became a reservoir, exploited both for electric generation and irrigation of nearby farmland. Initially planned in 1969 by the Portuguese government with World Bank funds, construction halted in the 1970s during the Civil War. The dam was finally completed between 2007–2012 by a Brazilian company during a spate of infrastructure investment by the Angolan government. Today the dam's large spillway and hydroelectric intake station boast a 60-megawatt capacity, although a series of droughts have prevented it from reaching full power. The dam feeds a network of high-tension transmission lines across the land as far as Huambo. Nearby towns such as Cuma and Chipindo are sparsely populated, most under 10,000 people, though an airstrip and series of small villages can be seen along the bottom of the image.

Keywords: Settlement, Patchwork, Cultivation, Rhizomic, Macroform



Location: Latitude 13°25'06"S, Longitude 15°50'36"E, Altitude 11 miles.

Date: 12 July 2018 (accessed 9 March 2019)

Xochimilco

Xochimilco is the last place where one can see remnants of the chinampas macroform that once dominated the Mēxihc Valley. Chinampas are woven reed mats piled up with multiple layers of mud to create new land within a lake, marsh, or swamp. Spaces between the built-up land are given over to canals. As a landscape, the chinampas afforded dense agricultural settlement with an efficient transportation network for moving people and goods. Aztec rulers expanded the chinampas across the five major lakes of the valley, including Xochimilco, located in the south of today's Mexico City. Spanish invaders drained most of the lakes, but left Xochimilco largely to its own devices. Today this UNESCO World Heritage site retains a significant agricultural function as one of the centers of flower production for the metropolis. However, the influx of population spreads urbanizing forms into the chinampas, causing the land to sink more rapidly and polluting the canals. With water increasingly siphoned off for urban households, less is available to recharge the canals, and the area is subject to extensive silting.

Keywords: Settlement, Cultivation, Gridded, Macroform



Location: Latitude 19°15'48"N, Longitude 99°05'22"W, Altitude 5,418 feet.

Date: 28 December 2009 (accessed 12 April 2019)

Hashima

Hashima is an island converted into a machine inhabited by ghosts. Located nine miles off the coast of Nagasaki, Hashima is part of an archipelago surrounding the Kumamoto peninsula in the south of Japan. Beginning in the 1880s during the Meiji period, the island played an important role in national industrial development as a base for submarine coal mining. In the 1920s and 1930s, the Mitsubishi concession increased investment in heavy mining, spurring the development of larger apartment blocks as well as a school, hospital, and other public facilities. During World War II, it was a site of forced labor for Chinese prisoners and conscripted Korean civilians. Upon restoration in the 1950s, the island reached its peak population of 6,000 people, making it the most densely inhabited place on earth. In the 1970s, Japan switched to petroleum and nuclear energy, leading to the abandonment of Hashima island, which remained closed to visitors from 1974 to 2009. Today it offers tour groups a post-apocalyptic spectacle of ruined concrete towers and rusting industrial equipment overgrown with plants.

Keywords: Isolate, Industrial, Settlement, Diagrammatic, Bespoke



Location: Latitude 32°37'20"N, Longitude 129°44'19"W, Altitude 3,172 feet.

Date: 12 December 2016 (accessed 12 April 2019)

Mithi Estuary

As it meanders into Mumbai, the Mithi River slows, shallows, and widens, forming an estuary up to one half a mile across that discharges into the Arabian Sea. Along the South bank sprawls the community of Dharavi, one of the largest informal settlements in the world. Tucked into Dharavi are the Koliwada, families who have fished the estuary for generations and who descend from some of the earliest inhabitants of Mumbai. The Mithi river has grown increasingly polluted since the 1980s, as sections of metropolitan Mumbai along its banks have swelled with high-density settlements. To overcome these problems, the Koli have employed a practice that dates back hundreds or even thousands of years in riparian zones of central India. They have painstakingly removed silt sediments, constructed berms to create tanks or ponds, cultivated mangrove trees for soil retention, and engineered mud dams to regulate the tides that rush in and out from the sea. Over time, the pollutants in the tanks soak into the sediments or discharge into the sea, and the water becomes cleaner, allowing the Koli to establish viable fisheries.

Keywords: Settlement, Extractive, Cultivation, Patchwork, Macroform, Rhizomic



Location: Latitude 19°02'59"N, Longitude 72°51'16"E, Altitude 5,403 feet

Date: 27 October 2018 (accessed 9 March 2019).

Iran-Iraq Border

This image reveals fortifications and battle scars exquisitely etched into the desert landscape just north of Basra. Part of ancient Sumeria, the area known today as Khorramshahr in Iran and Shatt Al-Arab in Iraq lies 58 miles inland from the Persian Gulf and 10 miles west of the conjunction of the Tigris and Euphrates rivers. To the left of the long vertical line lies Iraq, with numerous traces of circular gun emplacements, military access roads, earthworks and battlements. Similarly, the war-weary Iranian terrain spreads to the right through a series of remnant grid formations, campsites, ramparts, and large gun arrays. The two nations waged war on a horrific scale from 1980 to 1988, with much fighting concentrated in this region due to its vast oil reserves. Oil, however, was only a means to an end in war conducted for religious, cultural, and regional supremacy. Today, a region that once housed millions of soldiers has fewer than 250,000 residents inhabiting some 1500 square miles. Substantial stretches of the landscape remain toxic from petrochemical fires ignited during relentless ground and aerial bombardment.

Keywords: Logistical, Modular, Rhizomic



Location: Latitude 30°58'16"N, Longitude 48°02'41"E, Altitude 37,457 feet.

Date: 10 February 2017 (accessed 12 April 2019).

Leavenworth

The United States Penitentiary at Leavenworth presents a carceral diagram set amid an expanse of flat agricultural and prairie landscape. Converted from a maximum to medium security facility in 2005, the prison sits at the northern edge of Leavenworth, Kansas, just under one mile west of the Missouri River. A massive wall brackets the ensemble of cellblocks, administrative buildings, paths, and yards, reading like some great cartouche of confinement. The St. Louis architectural firm of Eames & Young designed Leavenworth's principal buildings in 1895, deploying a neoclassical style they would later use for the Palace of Education building at the 1904 World's Fair. To the south, the main building faces a gridded neighborhood of small single-family homes; to the north stretches the large administrative and residential campus of Ft. Leavenworth. Surrounding the prison on all sides, the gently sloping topography facilitates surveillance and detection. While the federal prison houses a disproportionate number of Black, Latino, and Native men, the town of Leavenworth is nearly 80% white.

Keywords: Diagrammatic, Bespoke, Colonial, Isolate



Location: Latitude 39°20'17"N, Longitude 94°56'53"E, Altitude 3,989 feet.

Date: 21 September 2013 (accessed 9 March 2019).

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References

- Allain, Rémy. 2004. *La Morphologie Urbaine*. Paris: Armand Colin.
- Andersson, Kjell et al, eds. 2009. *Beyond the Rural-Urban Divide: Cross-Continental Perspectives on the Differentiated Countryside*. Bingley, UK: Emerald Press.
- Bell, John Stewart. 1987. *Speakable and Unsayable in Quantum Mechanics*. Cambridge, UK: Cambridge University Press.
- Boyer, M. Christine. 1986. *Dreaming the Rational City: The Myth of American City Planning*. Cambridge, MA: MIT Press.
- Brenner, Neil and Christian Schmid. "Towards a New Epistemology of the Urban?" *City* 19 (2-3): 151-182.
- Buckley, Michelle and Strauss, Kendra. 2016. With, Against and Beyond Lefebvre: Planetary Urbanization and Epistemic Plurality. *Environment and Planning D: Society and Space*, 34(4): 617–636.
- Benjamin, Walter. 2002. *The Arcades Project*. New York: Belknap.
- Burguière, André. 2006. *L'École des Annales: Une histoire intellectuelle*. Paris: Odile Jacob.
- Chen, Brian X. 2008. "Google's Super Satellite Captures First Image." *Wired*. 8 Oct.
- Damon, Julien, Hervé Marchal, Jean-Marc Stébé, and Peter Hamilton. 2016. "Sociologists and the Peri-Urban: Its Late Discovery, Changing Definitions and Central Controversies." *Revue Française de Sociologie (English Edition)* 57 (4): 418–36.
- De Landa, Manuel. 2000. "Deleuze, Diagrams, and the Genesis of Form." *Amerikastudien / American Studies* 45: 33-41.
- Deleuze, Gilles and Félix Guattari. 2007. *A Thousand Plateaus: Capitalism and Schizophrenia*. Minneapolis, MN: University of Minnesota Press.
- Dial, Gene et al. 2007. "The GeoEye Satellite Constellation." *Proceedings of the 2006 Civil Commercial Imagery Evaluation Workshop*. Stennis, MS: NASA.
- Dorrian, Mark, and Frederic Pousin. 2013. *Seeing From Above: The Aerial View in Visual Culture*. London: I.B. Tauris.
- Easterling, Keller, Jesse LeCavalier, and Claire Lyster. 2016. "Logistics, Flow, and Contemporary Urbanism." Audio recording by Cabinet magazine. Accessed April 22, 2019. http://cabinet-magazine.org/events/easterling_lecavalier_lyster_logistics_flow_contemporaryurbanism.php.
- Edwards, Clark. 1976. "The Political Economy of Rural Development: Theoretical Perspectives." *American Journal of Agricultural Economics* 58 (5): 914–21.

- Engels, Friedrich. [1845] 1950. *The Condition of the Working-Class in England*. London: Allen and Unwin.
- . 1970. *The Housing Question*. Moscow: Progress Publishers.
- European Environment Agency. 2015. "Global Megatrends: Towards a More Urban World." in SOER 2015. Copenhagen, Denmark.
- Florida, Richard. 2018. "Rural America Doesn't Lack a Creative Class." CityLab. Accessed April 23, 2019. <https://www.citylab.com/life/2018/11/creative-class-jobs-urban-rural-america-workforce-data/574558/>.
- Foerch, Andrew. 2017. "The Genesis of Google Earth." *Trajectory Magazine*. Accessed April 22, 2019. <http://trajectorymagazine.com/genesis-google-earth/>.
- GPS.gov. 2018. "Selective Availability." Accessed April 22, 2019. <https://www.gps.gov/systems/gps/modernization/sa/>.
- Geertz, Clifford. (1973). *The Interpretation of Cultures*. New York: Basic Books.
- Goonewardena, Kanishka. (2018). Planetary Urbanization and Totality." *Environment and Planning D: Society and Space* 36(3): 456-473.
- Halprin, Orit. 2015. *Beautiful Data: A History of Vision and Reason since 1945*. Durham, NC: Duke University Press.
- Heathcott, Joseph. 2019. "Mexico City Morphologies." *Streetnotes* 26: 1-27.
- Hecht, Gabrielle, ed. 2007. *Entangled Geographies: Empire and Technopolitics in the Global Cold War*. Cambridge, MA: MIT Press.
- Heilbron, Johann et al, eds. *The Rise of the Social Sciences and the Formation of Modernity*. Dordrecht, Netherlands: Springer Science.
- Hendrickson, Clara, Mark Muro, and William A. Galston. 2018. *Countering the Geography of Discontent: Strategies for Left-behind Places*. Washington, DC: The Brookings Institution.
- Hostetler, Nick. 2012. *Eurocentrism: A Marxian Critical Realist Critique*. New York: Routledge.
- Houghton, Jennifer. 2013. "Entanglement: The Negotiation of Urban Development Imperatives in Durban 's Public-Private Partnerships." *Urban Studies* 50 (13), 2791-2808.
- Irwin, Elena G., Andrew M. Isserman, Maureen Kilkeny, and Mark D. Partridge. 2010. "A Century of Research on Rural Development and Regional Issues." *American Journal of Agricultural Economics* 92 (2): 522-53.
- Kline, Ronald. 2017. *The Cybernetic Moment*. Baltimore, MD: Johns Hopkins University Press.
- Kurgan, Laura. 2013. *Close Up at a Distance: Mapping, Technology, and Politics*. Cambridge, MA: MIT Press.
- Lafontaine, Céline. 2007. The Cybernetic Matrix of 'French Theory.' *Theory, Culture, and Society* 24 (5): 27-46.
- Latham, John S, Renato Cumani, Ilaria Rosati, and Mario Bloise. 2014. "Global Land Cover SHARE (GLC-SHARE) Database Beta-Release Version 1.0." <http://www.fao.org/uploads/media/glc-share-doc.pdf>.
- Lefebvre, Henri. 2014. *Critique of Everyday Life*. Translated by John Moore. New York: Verso.
- . 1991. *The Production of Space*. Translated by Donald Nicholson-Smith. 1 edition. Malden, Mass.: Wiley-Blackwell.

- . 2003. *The Urban Revolution*. Translated by Robert Bononno. Minneapolis: University Of Minnesota Press.
- Lenin, V. I. 1894. "What the 'Friends of the People' Are and How They Fight the Social-Democrats." Accessed April 23, 2019. <https://www.marxists.org/archive/lenin/works/1894/friends/01.htm>.
- Lichter, Daniel T., and David L. Brown. 2011. "Rural America in an Urban Society: Changing Spatial and Social Boundaries." *Annual Review of Sociology* 37: 565–92.
- Marx, Karl. 1996. *Das Kapital: A Critique of Political Economy*. Washington, D.C.: Regnery Publishing.
- Marx, Karl, and Friedrich Engels. 2011. *The German Ideology, Including Theses on Feuerbach*. Amherst: Prometheus Books.
- Moore, Mick. 1984. "Political Economy and the Rural-Urban Divide, 1767–1981." *The Journal of Development Studies* 20(3): 5-27.
- O'Mara, Margaret Pugh. 2015. *Cities of Knowledge: Cold War Science and the Search for the Next Silicon Valley*. Princeton: Princeton University Press.
- Peake, Linda. 2016. "The Twenty-First-Century Quest for Feminism and the Global Urban." *International Journal of Urban and Regional Research* 40(1): 219-227.
- Perkin, Harold. 1989. *The rise of the professional society: England since 1880*. London: Routledge.
- Pias, Claus. 2016. *Cybernetics: The Macy Conferences 1946-1953. The Complete Transactions*. Zurich: Diaphanes Publishing.
- Prakash, Gyan. 2010. *Mumbai Fables*. Princeton: Princeton University Press.
- Radoine, Hassan. 2011. "Planning Paradigm in the Madina: Order in Randomness." *Planning Perspectives* 26(4): 527-549.
- Rapaport, Amos. 1992. "On Cultural Landscapes." *Traditional Dwellings and Settlements Review*, 3(2): 33-47.
- Rosenberg, Jonathan. 2004. "Power of 2." Official Google Blog. Accessed April 21, 2019. <https://googleblog.blogspot.com/2004/10/power-of-2.html>.
- Roy, Ananya. 2011. "Slumdog Cities: Rethinking Subaltern Urbanism." *International Journal of Urban and Regional Research* 35(2): 223-238.
- Roy, Ananya. 2015. "What is Urban about Critical Urban Theory?" *Urban Geography* 37(6): 810-823.
- Roy, D.P. et al. 2014. "Landsat-8: Science and Product Vision for Terrestrial Global Change Research." *Remote Sensing of Environment* 145: 154-172.
- Sauer, Carl. 1916. *The Morphology of Landscape*. Berkeley, CA: University of California Press.
- Scott, Allen and Michael Storper. 2015. "The Nature of Cities: The Scope and Limits of Urban Theory." *International Journal of Urban and Regional Research* 39(1): 1-15.
- Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. 2018. *The IPBES Assessment Report on Land Degradation and Restoration*. Bonn, Germany: United Nations.
- Simmel, George. [1903] 1976. "The Metropolis and Mental Life." *The Sociology of Georg Simmel*. New York: Free Press.

- Simone, AbdouMaliq and Edgar Pieterse. 2017. *New Urban Worlds: Inhabiting Dissonant Times*. Cambridge, UK: Polity Press.
- Wirth, Louis. 1938. "Urbanism as a Way of Life." *American Journal of Sociology* 44(1): 1-24.
- Wood, Denis. 2011. *Everything Sings: Maps for a Narrative Atlas*. Los Angeles: Siglio.
- Zeiderman, Austin. 2018. "Beyond the Enclave of Urban Theory." *International Journal of Urban and Regional Research*, 42(6): 1114-1126).

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Urban Bites and Agrarian Bytes: Digital Agriculture and Extended Urbanization

TIMOTHY RAVIS AND BENJAMIN NOTKIN

Abstract

Capitalist agriculture faces a crisis. Plateauing yields and profits are driving up food prices, and the ability to continue the traditional practice of expanding into new, un-commodified territories appears to be waning. This crisis is due in large part to the accelerating biophysical contradictions of industrial agriculture, which systematically undermine the ecological conditions for its own success in pursuit of profit. We investigate how digital technologies are deployed as a potential data fix that does not solve the crisis but merely staves it off. We situate these technologies within the material context of capitalist urbanization, along the way arguing for bringing information back into the neo-Lefebvrian framework of “extended” or “planetary” urbanization. Digital agriculture technologies continue the centralization of economic knowledge and power as they facilitate the transformation of vast territories into “operational landscapes” that provide the material, energy, and labor for a rapidly expanding urban system.

Keywords: Digital Agriculture, Precision Agriculture, Extended Urbanization, Planetary Urbanization, Globalization, Agrarian Studies, Depeasantization, Globalization, Computation

“Eventually, precision agriculture could take humans out of the loop entirely. Once that happens, the world won’t just see huge gains in productivity. It will see a fundamental shift in the history of agriculture: farming without farmers.”

—Foreign Affairs Magazine (Lowenberg-DeBoer 2015)

“99% of all technological disruption is there to merely ensure that nothing of substance gets disrupted at all.”

—Evgeny Morozov (2019)

Introduction: Feeding “the Next Two Billion”

Hundreds of reports and articles begin with a variation on the same apocalyptic exhortation: The combination of population growth, food price volatility, and climate change demands a new agricultural revolution to expand and secure the global food supply. The biotechnologies first deployed in the Green Revolution are still being constantly improved; food prices, however, stay stubbornly high and many fear a yield plateau. The new revolution, they argue, is digital technology. In a recent article about the use

of artificial intelligence in agriculture, for example, Wired gushed about “an explosion in advanced agricultural technology, which Goldman Sachs predicts will raise crop yields 70 percent by 2050” (Janger 2018). Goldman, for their part, estimate that digital agricultural technologies will become a \$240 billion market by 2050 (Revich et al. 2016). X, Google’s “moonshot” venture, recently hailed the arrival of “the era of computational agriculture” (Grant 2019). Traditional agribusinesses have found themselves competing with Silicon Valley giants, venture capitalists, scrappy startups, intergovernmental organizations, non-governmental organizations (NGOs), and research institutions to develop and market a dizzying array of new technologies to feed “the next two billion” and save the world.

“Digital agriculture” is a heterogeneous suite of information-rich, computationally-complex, and often capital-intensive methods for improving the efficiency of agricultural land and the profit margins of sectoral actors. Digital technologies have come to play a role in every stage of the agricultural cycle under capitalism, from input management to marketing produce, pricing commodities futures to pest control. However, while it is true that these technologies increase efficiency, we contest the notion that they will provide a long-term solution to the looming crises of the global food system. For what the narrative of an agricultural techno-revolution elides is how the methods of industrialized food production (e.g. intensive use of fertilizers and fossil fuels, monocropping, huge amounts of livestock) create these challenges in the first place. We interpret the rise of digital technologies in agriculture as the continuation of a process dating back to the Green Revolution, namely, to reconfigure agrarian life in a manner amenable to increased profits, especially for actors further up the value chain. For the proponents of digital agriculture, the transition is between two technologically-paved pathways to profit: innovations in high dimensional computing supersede innovations in breeding. A purely technological perspective is insufficient and depoliticizes analyses of far-reaching changes to agricultural production, changes which have an effect on the rest of the capitalist economy (Patel 2013). Nevertheless, this has not stopped digital agriculture’s boosters from frequently claiming that it heralds a “fourth agricultural revolution.”¹

However, digital agriculture has received limited critical attention from social scientists. The vast majority of critical work on the ascendancy of global technology mega-firms and new information-centric accumulation strategies looks at their effects in non-agrarian industrial and service sectors. However, the generation of profits in these sectors depends in part on keeping inputs for production and reproduction—like food—artificially cheap (Moore 2010). By perpetuating an unsustainable regime of cheap food, digital agriculture technologies support the continued expansion of an equally unsustainable global urban system.

1 Refer to, for example, Trendov et al. 2019

We argue that the rise of digital agriculture is emblematic of an intensifying relationship between zones of agrarian production and extraction on the one hand, and zones of agglomeration, industrial production, and service provision on the other. A body of neo-Lefebvrian scholarship describes these apparently distinct zones as co-constitutive, entangled in a dialectic of extended and concentrated urbanization (Monte-Mor 2004; Soja 2010; Brenner 2013; Brenner and Schmid 2014). In this framework, the growth imperative of capitalism requires the transformation of vast landscapes beyond the ‘city’ to increase extraction and agricultural output, the product of which is drawn back inward to fuel growth. In this reading, the socio-metabolic process of urbanization is increasingly generalized, to the point that some have argued for thinking of contemporary urbanization as a ‘planetary’ process.

With this in mind, this article interrogates the political economy of digital agriculture and reinterprets the digitalization of the food system through the lens of extended–concentrated urbanization. We begin by introducing digital agriculture and the limited social scientific literature on the topic. Next, we critique the mainstream rhetoric surrounding digital agriculture, which makes a Malthusian argument for the need to feed a burgeoning global population in the face of climate change. Then, beginning from the observation that the crucial role of information is under-analyzed in the extended–concentrated urbanization framework, we build a theoretical argument for how digital agriculture challenges the urban–rural binarism. We locate the framework’s origins as a reaction to earlier threads of globalization theory, which emphasized the supposedly immaterial nature and deterritorializing effects of information and communications technologies (ICTs). The ‘urbanization of hinterland’ (Brenner 2016) requires the ability to observe, interpret, and manage processes of extended urbanization from zones of concentration. We then “bring information back in” by introducing a more materialist analysis of the role of information in global capitalist space, which centers on computation capital: the infrastructure necessary to transport and make legible enormous amounts of data. In this framework, digital agriculture can be reinterpreted as a “data fix” for multiple entangled crisis tendencies of urbanization. These include the well-documented ecological crisis caused by industrialized agriculture—necessary to keep food prices, and therefore wages, low enough to generate profits in the traditionally ‘urban’ secondary and tertiary sectors—as well as a potential crisis of the overaccumulation of computational capital. This crisis response, in turn, reconfigures the concentrated–extended dialectic of urbanization. The digitalization of agriculture further consolidates agrarian knowledge and decision-making away from the fields and among agribusiness and, newly, technology actors. We note how this off-siting transforms agrarian land tenure and deskills agricultural workers. This connects directly to the concept of ‘depeasantization’ (Araghi 1995), which can be understood as the mirror of urban agglomeration. We conclude with some suggestions for future research on digital agriculture’s effects on the urban/rural divide.

A Digital Agriculture Primer

The intensive use of information technologies in agriculture has received limited attention from social scientists. As recently as 2016, Bronson and Knezevic, in taking a critical look at how such tools affect the power dynamics between farmers and corporations, noted that “there has been no attention given to Big Data’s implications in the realm of food and agriculture” (1). In the years since, a steady trickle of publications has begun addressing this gap: on a “data grab” (Fraser 2018); on the unequal ability between farmers and firms to use data (Weersink et al. 2018; Lioutas et al. 2019); on digital agriculture’s transformation of farmers into consumers (Carolan 2018; Eastwood et al. 2019); on the racialized exploitation of labor (Rotz et al. 2019); on the embedded norms of digital agriculture (Bronson 2019); and on alternatives (Van der Burg et al. 2019).

A variety of labels have been used for this emergent industry: precision agriculture, e-agriculture, smart agriculture, and digital agriculture, among others. Despite early critical use of precision agriculture, the term tends to be used in the industry to signify a specific suite of production-oriented technologies.² However, information technologies are also used to open new markets (to producers, traders, and investors) and new territories for production. For example, digital platforms have become increasingly important for individual producers to bring their goods to market. Figure 1 shows how information technologies are intertwined throughout the cycle of agricultural production and sale.

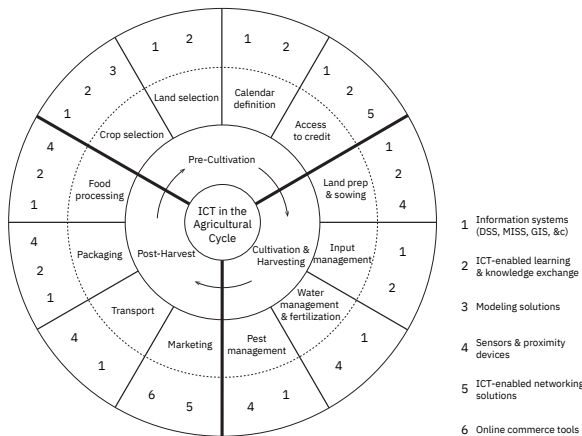


Figure 1 Information technologies in the agricultural cycle.

Source: Deloitte in World Bank 2012.

² While precision agriculture as a term has been used since the 1990s, the International Society for Precision Agriculture only officially defined the term in the summer of 2019 (www.ispag.org/about/newsletters?preview=90).

We use digital agriculture for its semantic breadth and increasing currency. In our taxonomy, precision agriculture is a subset of digital tools which improve efficiency through careful management of inputs. Three other types of tools—marketplace and financial platforms, e-extension, and smallholder management—are typically platform-based systems that mediate the social relation between farmers and the outside world. Marketplace and financial technologies help farmers access new credit lines and optimize their market behavior. E-extension is the digitalization of the practice of implementing technological innovations through farmer education, particularly in the international development context. E-extension, like the analog version that preceded it, is largely reliant on insights produced far from the farm. Finally, smallholder management platforms allow larger agribusinesses to exert control over smallholder farmers through close management of their inputs, products, and so forth. This may allow major actors to divest themselves of the risk inherent in owning land and instead subcontract smallholders in a relationship analogous to other platforms in the gig economy.

Searching for Techno-Revolution

For digital agriculture’s boosters, it has the potential to be the much-needed “fourth agricultural revolution” (refer to, *inter alia*, Lombardo 2014; Lowenberg-DeBoer 2015; De Clercq 2018). In particular, it is framed as a climate-friendly way to feed the world and improve the lot of farmers around the world. By making the application of inputs (seeds, fertilizer, water, fuel, etc.) more efficient, digital agriculture can indeed lessen the environmental impact and yield of agriculture. By increasing input efficiency and improving knowledge of market demand, digital agriculture may indeed improve the fortunes of producers. The rhetoric is not dishonest, but it is incomplete.

Claim 1: Digital Agriculture is about Improved Environmental Outcomes

Optimizing inputs enables the continued use of ecologically-harmful chemicals and practices, which would otherwise be abandoned if their effects were not actively mitigated (Bronson 2019). Digital agriculture’s marketing claims it will improve efficiency, increasing yield and minimizing the use of inputs—many of which are harmful and unsustainable. The externalities produced by using these inputs are the “un- and undervalued costs of industrial capitalist agriculture” (Weis 2010, 316). A team at Cornell, for example, has developed a model that recommends ideal fertilizer application rates for each section of a farmer’s field in order to minimize nitrogen runoff into the Gulf of Mexico, which causes algal blooms, depletes oxygen levels in the water, and kills fish and wildlife.³ While optimization limits the short-term damage of unsustainable practices, it also makes those practices more politically permissible and financially

³ The technology has since been licensed to the global agricultural products conglomerate Yara International.

feasible. Thus, by making unsustainable practices *appear* sustainable, the necessity of adopting more ecologically and socially sustainable and just practices is delayed. By focusing on input management, these technologies advance a limited interpretation of sustainability that still depends on off-farm inputs, rather than a more radical shift to permanently sustainable practices (Barbieri et al. 2019).

Claim 2: Digital Agriculture is about Improving Yields and Solving World Hunger

Just as digital agriculture promises to minimize inputs, it also promises to maximize yield—yet yield is not the problem. In the 1970s Amartya Sen noted that while starvation was increasing globally, food per capita was also increasing (1977, 33)—as population grew, food production grew at a greater rate, not only globally but even regionally. While some scholars have taken issue with Sen’s empirical basis, an updated analysis using 2010 statistics found the same results (Scanlan, et al. 2010). The direct relationship between hunger and food per capita, when we would expect an inverted one, betrays the simple thesis that hunger is due to a lack of food availability. Instead, Sen attributes hunger to an inability to *exchange* for food. Davis similarly notes the disconnect between food availability and hunger, finding that famine can occur in areas of grain surplus because it is more attributable to rural food management and exploitation than to production (2001). The “solution” to hunger, then, lies not in yield. Yield has increased; food per capita has increased; hunger persists. Therefore, stretching yield through digital agriculture is insufficient and does not address the political-economic basis of systemic hunger.

Claim 3: Digital Agriculture is about Improving the Welfare of Farmers

The third key claim made by digital agriculture’s boosters is that it will improve farmers’ welfare, in particular their profits. Profits may be found in better decision-making, better yields, and better access to market information (refer to, *inter alia*, World Bank 2019). In the Global North, such increased profits may be plausible. However, a primary mode for digital agriculture, the platform service, means that the data produced typically becomes the property of the platform provider. Weersink et al. (2018) note that a key challenge for digital agriculture is making this data useful; this, in turn, may favor larger companies with the capacity to process the data. Bronson (2018) notes this dynamic and warns that it may reproduce the distributional effects of the Green Revolution—that is, to concentrate wealth and power in the hands of major agribusinesses.

In the Global South, digital agriculture presents a different set of problems for farmers’ welfare. Technological innovation that increases a crop’s yield in turn increases supply and undercuts the socially necessary labor time required to produce it. This dynamic lowers the crop’s exchange value at the expense of those at the bottom of global commodity chains, in particular the growers’ compensation per unit of crop. As this price drop is not accompanied by any increase in production for farmers

without access to this technological innovation, this drop translates to lower overall compensation and to “exchange entitlement decline” (Devereux 2001). If they depend on exchange for subsistence, the decreased compensation translates to hunger as well. Digital agriculture’s strategy of overcoming hunger by increasing yield thereby may even exacerbate it.

In reflecting on these mainstream claims, a different theme emerges. Rather than sustainability, nourishment, or farmer welfare, digital agriculture is fundamentally about securing the conditions to generate profit in the food system. Crucially, however, this is not about profit in food production alone, but in the wider capitalist economy for which food is obviously a fundamental input. Therefore, we submit that digital agriculture must be understood as addressing a specific set of crisis tendencies that have emerged at a particular juncture in the social, ecological, and spatial history of capitalism. This juncture is defined by interlocking moments of ecological disaster; enormous advances in information production, gathering, and processing; and “hyper-trophic” urbanization (Ajl 2014).

Digital Agriculture as Data Fix

In this section we argue that rather than a solution to the climate crisis, hunger, or farmer welfare, the rise of digital agriculture can better be understood as an attempt to overcome crisis tendencies of “the relentless growth imperatives of an accelerating, increasingly planetary formation of capitalist urbanization” (Brenner and Schmid 2015, 153). After briefly excavating the informational dynamics latent within the framework of extended and concentrated urbanization, we describe how digital agriculture functions as a “data fix” by allowing the intensification of agricultural industrialization and the extraction and enclosure, for eventual profit, of the data produced by digital agriculture technologies.

An early theme in globalization literature was a tendency to embrace the rise of information technologies in a way that dematerialized the now planetary systems of extraction, production, and consumption (e.g. Lazzarato 1996; Webster 2002; Castells 2010). Such concepts, however, have largely been absorbed by analyses which show that a deterritorialized “information society” is not displacing traditional modes of production and social relations as much as emerging as a financial-managerial stratum in a “new international division of labor.” Another major theme in globalization studies is the ‘global city network,’ a set of nodes in the global space of flows from which the global economy could be commanded and controlled (Sassen 1991). In describing such cities as “strategic sites where global processes materialize” (Sassen 1998, 392), they appear to be material sites floating in a sea of immaterial processes. In this model, cities are simultaneously the result of, yet alienated from, specific material processes—such as agricultural production—taking place beyond their bounds. In both concepts the informational nature of globalization is over-emphasized at the expense of its material effects. In an era of climate crisis, this shortcoming is glaring.

One response has been to radically reframe globalization as a material process of urbanization, which unfolds as the product of dialectically-entwined moments of extension and concentration (Brenner and Schmid 2013, 2015; Brenner 2013, 2016). Concentrated urbanization signifies the moment of agglomeration where the material flows of global capitalism accumulate into cities, megalopolises, and mega-regions. On the flip side, extended urbanization is the moment where remote territories are enclosed and transformed into operational landscapes that funnel energy, materials, and food into areas of accumulation. Both moments cause and are caused by the other: “The urban unfolds into the countryside just as the countryside folds back into the city” (Merrifield 2011, 474). Global capitalist urbanization is a metabolic process of moving and consuming the material world (Bridge 2009). This involves both fragmentation and homogenization (Arboleda 2016)—for example, the simultaneous expansion of monoculture agriculture and of liberal private property regimes. At the same time, enclosure and technological advances deprive peasants of their livelihoods; ‘depeasantization’ (Araghi 1995) is the mirror of urbanization.

However, the desire to develop a more materialist model of globalization leads to the black-boxing of information’s role in facilitating vast networks of production and exchange. To bring information back in requires recognizing that something happens at the moment of concentration which sets the stage for extension. In the present framework, production and the growth imperative drive a search for more raw materials. But extension also depends on informational infrastructure to make a massively decentralized network of global supply chains profitable. Indeed, another way to describe capitalist geography is as “a skein of somewhat longer networks that rather inadequately embrace the world on the basis of points that become centers of calculation” (Latour 1993, 121). Information, along with material, is being drawn inwards in the moment of concentration; the processing of raw information—which is “what remains after one abstracts from the material aspects of physical reality” (Reskinoff 1988, 2)—into actionable knowledge informs extension processes. “Information processing” is computation, and computation at the scale required to make legible the vast amounts of data produced in the contemporary economy involves enormous physical infrastructural investment in data centers, undersea cables, and satellite networks (Fard 2018). Such computational capital consists also of intellectual and human capital in the form of models, algorithms, and the expertise to deploy them.

There is a potential for the overaccumulation of computational capital, however; as a result, there is a constant drive for firms to find productive outlets. This is what leads firms like Amazon, Microsoft, Google, Oracle, and Cisco—as well as funds invested in and consultancies hired by them—into digital agriculture. By locating, extracting, and enclosing data relevant to another materially productive sector (Sadowski 2020), a firm like Amazon—whose cloud computing infrastructure Jeff Bezos has compared to power utilities—can continue to grow. This applies at the worker level, too. Just as a glut of NASA-trained engineers and physicists became quants for hedge funds after

the Space Race (Markovits 2019), a glut of software engineers and data scientists which Silicon Valley cannot absorb find employment outside of the tech sector, including at digital agriculture startups or divisions within larger agribusinesses. Indeed, agribusiness are planning for a future in which they become tech companies themselves: the head of digital agriculture at Bayer Monsanto, for example, has described the future of the conglomerate as a digital platform (Bronson 2019).

The fundamental material crisis that digital agriculture attempts to fix through the manipulation of data is in the socio-metabolic processes of capitalism and capitalist urbanization. To support social reproduction for a growing non-agrarian population, present-day industrial agriculture destroys its own ecological foundations. As Weis (2010) explains, the externalized costs of industrial agriculture

are deeply contradictory in that they mask the deterioration of the very biophysical foundations of agriculture (316). . . In order to simplify, standardize and mechanize agriculture, and increase productivity per worker, plant and animal, a series of biophysical barriers must be overridden. Efficiency gains therefore hinge on many unaccounted, non-renewable and actively destructive fixes, with fossilized biomass having an indispensable role in this process (321).

As the consequences of climate change become ever more apparent and render growing conditions ever more difficult, a new ecological regime is needed to prolong the production of cheap food and ensure future accumulation in the face of known crises (Moore 2010). But not only is fossil fuel-based industrial agricultural production partially responsible for climate change—up to one-fifth of all greenhouse gas emissions—it also exhausts the ecologies within which it is practiced. The search for the fourth agricultural revolution is not a straightforward matter of addressing a Malthusian crisis of natural population growth, but a crisis of capitalism itself.

This crisis tendency arises from capitalism's dependency on the "four cheaps"—labor, food, energy, raw materials—to maintain each cycle of accumulation. Prices for these inputs are kept artificially low by finding hitherto un-commodified spaces, "appropriat[ing] unpaid work in service to commodity production" (Moore 2014, 288). Most work must go unpaid for profit to be possible—work that has been historically done by an unpaid and externalized "nature." However, economic growth leads to increased demands for these "cheaps," which in turn threatens to push prices up, threatening profits. This results in a perpetual search for new frontiers of appropriation. The relationship between such appropriation and the exploitation of labor is central. As Moore explains, "historical capitalism has been able to resolve its recurrent crises because territorialist and capitalist agencies have been able to extend the zone of appropriation faster than the zone of exploitation" (291). That is, new frontiers of "nature" have been found or created quickly enough to keep input values low enough to maintain relatively stable rates of exploitation of labor, and thus profits, over time. The danger to capital is the final exhaustion of all such frontiers.

One way that digital agriculture functions as a data fix is by preventing the foreclosure of existing geographical frontiers. By enabling better decision-making and improved efficiency at the individual, firm, and systems levels, it delays a final collapse of the existing mode of appropriation through industrialized practices. It also enables production in areas that were difficult to cultivate even using the biotechnologies developed in the 20th century—deserts, for example, or urban vertical farms—and by making distant territories legible to centralized firms, it reduces the risk of investment in land (Li 2014). However, maintaining a profit depends on data being artificially cheap, just like food, labor, energy, and raw materials.

Data can be kept cheap because of new frontiers which are not necessarily geographical. They can also be vertical—through “varied combinations of coercion, consent, and rationalization . . . [which] maximize the unpaid ‘work’ of life outside the circuit of capital but within reach of capitalist power” (Moore 2014, 293) within territories and societies already incorporated into capitalism. Slavery, unpaid domestic labor, and the stripping away of workers’ protections are all well-known—albeit differentially monstrous—examples of this tendency to appropriate labor to enable system-level profitability. Information, in the form of data, has frequently been described as a new factor of production. A growing body of literature in critical data studies investigates data as a resource to be enclosed, extracted, and reproduced (Sadowski 2020). Digital agriculture tools allow for the enclosure of agricultural data by tech companies and large agribusinesses. This potentially allows farmers to get higher prices for their products while maintaining equal or higher profit margins elsewhere in the system.

Concentration

Above we have argued digitalization of agriculture is a response to crisis tendencies of urbanization. Digital agriculture, though, is *urban* not only in its origins and motives, but also in its effects. Digital agriculture moves the production of agricultural knowledge, and subsequently agricultural decision-making, away from farms, and indeed, away from agrarian zones entirely. This removal empowers urban actors at the expense, both in wealth and agency, of agrarian actors, upending the quasi-equilibrium of the concentrated–extended dialectic of the past decades. In turn, this shift transforms the motivations and dynamics of agricultural decisions, and thus agricultural practices, land configurations, and actors.

Traditionally, the production of agrarian knowledge has been a process of slow, localized learning. Anthropologists attribute the adoption of agricultural innovations to a mixture of environmental observation and social learning, which often involves imitating peers and people of prestige (Boyd and Richerson 1985; Heinrich 2001 via Stone 2007). The knowledge produced is locally specific, both in regard to local ecology and local values. Farmers learn what to do through their own experience with their immediate ecology, and from listening to neighbors whose experience also derives from the local area. While agronomic innovation is often imported, the learning is still

a local “process of indigenous adaptation or reinvention” (Stone 2010, 13). How and whether to apply this foreign information filters through the same process of environmental and social learning.

The Green Revolution disrupted this process as agribusinesses bussed farmers into demonstration plots on important farmers’ lands to promote bioengineered seeds (Stone 2007). The firms thus eliminated the role of observational learning and co-opted the mechanisms of social learning to sell their products. Farmers continued to imitate one another’s seed selection, but the base learning never occurred. Furthermore, the pace of new seed development was too rapid for communities to truly produce the necessary knowledge to know how a particular seed performed, let alone under various conditions. The Green Revolution deskilled farmers and centralized knowledge with universities and private firms (Patel 2013).

The digitalization of agriculture expands this enclosure into new facets of agricultural practice. In a process common to data capitalism, digital agriculture conducts an “epistemic harvest” (Hunger 2018) in which physical events, actions, and conditions are translated into computationally comprehensible information. This translation into bits not only converts information into material representation, but the ability to move this information renders new spaces legible at a distance. Indeed, given the costs of computational capital, the data are often *only* legible at a distance, in urban control centers with the necessary means of processing. Moreover, the usefulness of these data often depend on their aggregation with other data. Data are relatively uninformative in small quantities, but tremendously generative when aggregated as “big data.” Typically, then, digital agriculture collects agricultural phenomena, whether through sensors or user input, abstracts them into binary form, sends them away for processing into information, and reimports this newly computed information to sites of agricultural production. In this model, knowledge is no longer *learned* by agrarian actors in agrarian zones; instead knowledge is *computed* by off-site processors and farmers are instructed on what to do. As with genetically modified organisms (GMOs), this process alienates farmers from the knowledge they depend on and centralizes it among non-growing actors.

Fraser (2019) labels this contemporary movement of information away from agrarian actors a “data grab” akin to earlier land grabs. The concentration of control shifts from ownership of land to the direction of practices. Agribusiness is already a highly consolidated industry, and its role in digital agriculture means the consolidation of digital agriculture’s information and profits. The ‘Big Four’ seed and chemical agribusinesses have more than 84% global market share in agrochemicals. Two of them—Bayer-Monsanto and Corteva—have more than 43% of the global market in seeds (IPES-Food 2017). Bayer and Monsanto merged in 2018, and Dow and DuPont joined in 2017 (before spinning off their combined agribusinesses as an independent company, Corteva, in June 2019). Further along the value chain, the ‘ABCD’ companies—Archer Daniels Midland (ADM), Bunge, Cargill, and Louis Dreyfus—dominate

agricultural commodities trading. It is estimated that 75–90% of the global grain supply passes through their hands.

All of these actors are investing heavily in digital agriculture. The Big Four's most notable efforts are designed to synergize with their seed and chemical offerings. For example, Corteva owns Granular, which links precision agriculture tools, such as satellite-based field monitoring and machine-learning based fertilizer advice, with a financial management platform. Bayer-Monsanto, BASF, and Syngenta each have prominently-branded digital offerings. Syngenta's not-for-profit arm developed the smallholder management platform FarmForce, which explicitly aims to bring farmers in the Global South into global markets—under Syngenta's aegis. The ABCD companies are also investing in digital platforms. In 2018, for example, ADM and Cargill jointly formed Grainbridge, a platform that provides financial and market decision-making support. All eight of these firms are continuously buying digital startups, and each operates a venture arm that invests in such companies.

Tech companies, startups, and NGOs are also involved in digital agriculture. Google Cloud Platform supports the MIT-run Open Agriculture Foundation, a “global community to accelerate digital agricultural innovation.” Microsoft not only partners with digital agriculture NGOs and startups like the sensor-focused SunCulture and platform-driven Ag-Analytics, but also has an in-house platform built on its Azure cloud computing network. FarmBeats, as it is known, is designed to underlie consumer-facing applications by integrating diverse datasets and feeding them into machine learning models. Amazon Web Services, Oracle, Cisco, and others also seek a place in the agriculture industry.

Globally, investment in agricultural technology grew eight times from 2013 to 2018. This was not just driven by agribusiness and Silicon Valley, however. Sovereign wealth funds have also invested hundreds of millions in digital agriculture and closely related sectors. For example, Temasek, Singapore's fund, has made digital agriculture a key focus of investment. In November 2019 it published “The Asia Food Challenge”—in partnership with PWC and Rabobank—to encourage investment in the sector. Earlier that same year, they launched an impact investment fund specifically targeting agricultural production.

While they are increasingly involving themselves in agriculture, these actors are not agrarian. Digital agriculture increases the control of agribusiness and facilitates the entrance of tech and VC firms. Through its capacity to render agriculture legible at a distance, digital agriculture enables firms traditionally outside of agriculture to easily lean into it, and in doing so enables a moment of primitive accumulation of data. Fraser (2019) sees hope in the possibility of ‘data sovereignty,’ a twenty-first century update of Friedmann's agropolitan districts in which growers control the data and knowledge of agricultural production, but that utopia does not yet exist. While digital agriculture could be a set of technologies that empower farmers to learn better, knowledge production via digital agriculture is instead overseen by urban actors, with

differing motives and agendas. In Finistere's 2018 report, a Wells Fargo executive justifies their data grab:

Growers don't really care about data. They care about whatever that will give them either more time or make them more profitable. The companies that really understand that dynamic and how to translate their value into dollars and cents will have the best shot, because they're able to provide links between field productivity and monetary results. Linkage to the financials is so, so important. Not just from a decision standpoint, but from the viewpoint of the bottom line (16).

Many of these firms and organizations involved in digital agriculture are headquartered and process data in sites of urban concentration. The humans of computational capital—the programmers and analysts who develop the digital tools and algorithms—are gathered in cities, and therefore the analytic work of digital agriculture occurs within them. The actors dominating digital agriculture, however, are urban not because of the locations of their offices, but because of their roles in the process of urbanization. As urbanization is a growth-driven process of imploding agglomeration that transforms and appropriates zones of support, the platform-providers of digital agriculture are growth-obedient instances of accumulation and consolidated control. Increasingly the world's countless farms are now partially managed by a countable set of digital agriculture firms.

Extension

The control of knowledge production enables the control of decision-making. The urbanization—the off-site consolidation—of agricultural knowledge through digital agriculture's data grab and the urban bias of computational capital subsequently urbanizes agricultural practices, and affords urban firms more remote influence over agricultural production. This instance of the transformation of the 'hinterlands' is achieved through instruction, nudges, contracts, and conforming. Through these direct and indirect processes digital agriculture has the potential to reconfigure cultivation, land, and labor in the interest of accumulation in non-agrarian urban sectors.

First, the design decisions embedded in digital agriculture prioritize particular growing practices. Precision agriculture privileges industrial planting practices and export-oriented crops. Satellite imaging that detects yield, disease, and pests, for example, depends on homogenous fields of homogenous seed, thus precluding actually sustainable practices of polyculture growing and intraspecific diversity. In order to benefit from many digital agriculture technologies, farmers need to simplify their production to fit into the strictures of what the new technologies can observe and optimize. This simplification is not only of practices but also of values and objectives, as digital agriculture prioritizes profit and export crops (Bronson 2019). The majority of in-field sensors are for soy, maize, and canola—that is, they are for commodity crops which go to and support sites of concentrated urbanization. These are crops which are

primarily intended for export markets and whose derivatives are commonly traded. Digital agriculture technologies, then, increase the advantage of large commercial farms and perpetuate certain data-legible decisions.

In the Global South, digital agriculture more often takes the form of e-extension. Conventionally, agricultural extension consists of field workers, on behalf of the state or development organizations, visiting farmers to educate them on better practices. With e-extension organizations can contact farmers through their mobile devices. This digitalization enables new actors, who are able to bypass the role of the state. As with traditional extension, these e-extension programs generally advise farmers on when and which crops to plant and on inputs to use. E-extension, however, is able to reach many more farmers much more quickly, communicate with them much more frequently, and make more specific recommendations.

The non-profit Precision Agriculture for Development (PAD) goes one step further by using A/B testing and machine learning, not to improve its advice but to increase the likelihood of farmers' adherence to its advice.⁴ While smallholders are not bound to PAD's recommendations, PAD (a) promises higher yields and profits, (b) holds a monopoly on knowledge, and (c) is using its knowledge to ensure obedience. This external control, a dynamic of urbanized agrarian knowledge, is problematic in its own right: while often very specific about climate and soil conditions, PAD appears to take little heed of local social, cultural, and political context, and determines its users' best interests for them.

The off-site decision-making, though, becomes more questionable when we learn that PAD has recently partnered with Bayer. Bayer funds PAD's work in Bangladesh and provides PAD with contact information for its former customers (Lehe 2019). PAD then advises these and other farmers on how much of which inputs to use, such as Bayer's fertilizer. PAD reported in 2019 that "farmers . . . were 18% more likely to report using a Bayer product, while trust and satisfaction did not change. Farmers also recommended Bayer products to 8 other farmers, on average" (Precision Agriculture for Development 2019, 4). Effectively, PAD is a marketing arm for agribusiness as it enlists smallholders into global commodity production. In pursuit of "long-term financial sustainability," and given the success of the Bayer pilot, PAD has begun to consider if "it is worth exploring whether incorporating brand promotions can help PAD and other partners develop commercial advisory services that can be sold to for-profit agribusinesses and offered free of charge to farmers."

Here PAD shifts from being a service for farmers to being a service for for-profit agribusiness. PAD continues to offer free advice to farmers, but its client has changed. The agribusiness company has replaced the farmer as PAD's primary relationship. E-Sagu represents an earlier example, beginning in 2004, of an e-extension company

⁴ PAD attributes this advice to other institutional sources more expert in agricultural advice, but PAD still ultimately decides which recommendations to make, acting as the curatorial gatekeeper of knowledge.

that connected farmers with urban agricultural experts and that ultimately turned to partnerships with input vendors to stay afloat (Stone 2010). Given the wealth extraction already wrought on agrarian and post-colonial zones and the exacerbation of that extraction via digital agriculture, such an e-extension service is unlikely to soon exist without similar privatization, unless supported by the state. We can expect e-extension to continue to be a means, like digital agriculture more broadly, of corporate and urban influence.

Second, digital agriculture not only perpetuates certain agricultural practices—namely export-oriented and input-dependent—it also, through partnerships such as with PAD and Bayer, and more straightforwardly through privately-owned PA companies, privileges larger farms and furthers corporate control of independently owned agricultural land.

In the US, the number of farms between ten and 1,999 acres has fallen since 2007, while the percentage of land in farms larger than 2,000 acres has increased from 40% to 47% in 2017 (USDA).⁵ This accompanies a general trend of increasing farm sizes (Deininger 2011), especially in high-income countries (Lowder et al. 2016), and the much discussed global land grab (Borras et al. 2011). While the reasons for this pattern are various, digital agriculture continues the privileging of larger farms. Digital agriculture favors wealthier farms that grow according to methods conducive to data collection and which produce profits sufficient to afford the technology. This privileging begins with the installation of these technologies. Implementation requires capital investment in sensors to acquire data, connectivity infrastructure to connect the data, and advanced machinery to use the data. The cost of this equipment limits much of its application to wealthier or more financialized farms (Bronson 2019).⁶ These significant investments give uneven returns, which further privilege larger-scale commodity-oriented farms.

Digital agriculture, though, also changes *control* of land, even when ownership does not change. McMichael, quoting the peasant coalition Via Campesina, observes of pre-digital agriculture agribusiness that

agribusiness power no longer resided in control over land, rather in the relations that surround agricultural production—those that “control loans, materials supply, the dissemination of new technologies, such as transgenic products, on the one hand, and those that control national and international product warehousing systems, transportation, distribution and retail sales to the consumer, on the other hand, have real power” (McMichael 2012, 684).

Digital agriculture adds to the litany. By dictating decision-making, firms achieve control of farms’ inputs and outputs without the risk of fixed assets or of produc-

⁵ Authors’ calculations, USDA censuses 2007, 2012, 2019.

⁶ This machinery becomes a new fixed cost for farmers, often requiring loans, thus further indebting farmers and financializing agriculture.

tion, and without any obligations to labor welfare. This risk minimization parallels the strategy of contract farming, in which firms set prices and conditions with farms at the beginning of the season. Firms, here too, dictate inputs, even providing loans for them. Under this arrangement farmers carry the risk of production—firms instruct what to grow but bear no liability for a bad harvest—all while production is organized into a form that caters to the interest of investment.

Digital agriculture, though, does not just parallel contract farming; it has also become a tool for contract farming. Smallholder farmer management platforms streamline the contracting process by facilitating communication from firm to farm and allowing firms to have more oversight of farms; by making contract farming easier and cheaper, these platforms then spread the model. Farmforce is a particularly notable example of such a platform, and through its Syngenta-provenance indicates contract farming's appeal to agribusiness corporations (Farmforce 2017). Digital agriculture further supports contractors by increasing their ability to forecast prices and thereby minimizing their price risk. Though this risk is minimal for contractors, primarily resting on growers (Sarkar 2014), firms still bear some degree of the price risk. While some platforms have also emerged to better inform farmers of market prices, firms remain better positioned, with greater computational capital, to forecast global production and demand, allowing them to set prices more in their interest.

These digital agriculture models not only minimize economic risk, they also minimize political risk. By allowing family ownership of farms, contract farming and e-extension give the appearances of independence and a distributed means of production and are therefore less provocative of land reform; agribusiness does not need to fear land seizure. In places where land reform has already occurred, such as Zimbabwe, these mechanisms represent a way forward for corporate control.⁷ Rather than a land grab, digital agriculture in the Global South facilitates a data and production grab. The appearance of smallholder ownership makes these new grabs more palatable and may demobilize rural classes.

Finally, digitalization disrupts agricultural *labor*. As an intensification of industrialized and automated agriculture more broadly, digital agriculture is anticipated to eliminate the need for farm labor (Carolan 2020), but its effects on labor are broader. Digital agriculture is likely to deskill workers, further bind their fortunes to the global commodity market and potentially turn them into urban migrants.

Digital agriculture's land consequences described above shape urbanization at its sites of both explosion and implosion. As it reconfigures land ownership in the operational landscapes of extended urbanization by privileging large estates and by making smallholding more amenable to capital's interests, it simultaneously denies the autonomy of the farmers on these smaller plots. Both of these are likely to incorporate

7 For a study of how contract farming has infiltrated and taken advantage of post-land-reform Zimbabwe, refer to Scoones et al. 2018. Agro Axess is one smallholder farmer management platform that has emerged in Zimbabwe to facilitate this contract farming.

more growers into the global commodity market to sustain non-agrarian production. Especially in the Global South, where subsistence farming is more common, digital agriculture's orientation toward larger farms may eventually displace smallholders and convert them into wage workers, as they leave their own plots and work for the commercial outfits.

Meanwhile, farmers that retain ownership are also further incorporated into the global commodity market because of PA and e-extensions recommendations. As such, their food security is undermined (Davis 2001, 289). They lose the means of subsistence, even as they maintain the means of production—they own land but increasingly do not own their time or behavior—and become more vulnerable to the “vagaries of world market prices” (Araghi 1995, 356).⁸ This threatens smallholder farmers' very ability to survive and pushes them toward wage work and cities for imagined greater stability (Sen 1977, 56; Araghi 2000). Contract farming and extension, even more so under their digital exacerbation, could lead to dispossession and displacement, and ultimately de-ruralization, sending peasants to cities to become informal urban surplus labor.

Digital agriculture also contributes to deskilling. As described above, digital agriculture changes how agrarian knowledge is produced and disseminated. As with urbanization at large, this change is important not only for how it concentrates, but also for how this concentration folds back onto the countryside. The disruption of agricultural learning deskills rural workers, ultimately undermining the farmer welfare digital agriculture allegedly pursues. Originally observed in manufacturing contexts, deskilling is the degradation of labor through the separation of mental from manual work; laborers are “more expensive and less controllable” than machines, and thus require replacement (Braverman via Stone 2007, 72). Stone takes this theory and partially applies it to agricultural production in the GMO era. He finds that deskilling appears differently in an agrarian context as, among other differences, farming is “much more dynamic” (73) and the farmer needs to make many more decisions than does a factory worker. He therefore finds that with agriculture, deskilling is primarily useful as a metaphor rather than a theoretical model.

A decade later, though, digital agriculture may make agricultural deskilling much more literal, by moving the decision-making off-site. With GMOs, farmers' learning process and ability to make decisions are disrupted by a rapid pace of new technologies they do not understand; they still, however, must make decisions. With digital agriculture, which informs farmers about what to do—whether through sensors or extension—this is no longer the case: farmers no longer need to make decisions as these decisions are made for them, from a distance. More data is needed to understand the effects of deskilling from digital agriculture's various technologies, but the bioen-

8 Araghi here is quoting Sen who, in expanded form, writes, “For those who do not grow food themselves (e.g. artisans or barbers), or those who do grow food but do not possess the food they grow (e.g. cash-wage agricultural labourers), the vagaries of the market can have a decisive influence on their ability (and that of their families) to survive” (Sen 1977, 56)

gineering feats of the late twentieth century give an indication of what is to come. As deskilling is not only the disruption of particular knowledges but the “disruption of the process of experimentation and development of management skill” (Stone 2007, 67), deskilling and the potential obsolescence of on-site decision-making has (concentrated) urban implications, especially should digital agriculture contribute to continued deruralization. This decapacitation of management skills not only disempowers the farmer as farmer, but also potentially renders them less qualified for the urban labor market, and potentially contributes to a less equipped urban reserve of labor. Within agrarian zones, deskilling could also have destructive ecological effects: Vandeman (1995) observed that deskilling alienated farmers’ knowledge of their own land.

Conclusion

The frequently proffered problematic of “feeding the next two billion” is not the fundamental reason a “digital revolution” in agriculture is necessary. The fundamental reason is industrial agriculture’s tendency to deprecate the conditions of its own success in order to keep food prices artificially low, which stabilizes the rate of labor exploitation in non-agricultural ‘urban’ sectors and permits the generation of profit. In other words, it is about using information, computation, and new surpluses of human nature to maintain the status quo of cheap food and subsidized capitalist urbanization.

This analysis is a very early cut at digital agriculture from the perspective of urban/rural relations. A great deal of further research is possible. Open-source platforms for farmer data management are emerging, for example, which allow producers to retain ownership over their data and therefore have the potential to reduce, if only partially, the power imbalance between farmers and transnational agribusinesses. We have also only touched on the role of machine learning and artificial intelligence, a field which is growing at an astonishingly fast rate and may soon have profound effects on digital agriculture. In the near future, “computational agriculture” may offer truly revolutionary developments.

Carefully tracing digital agriculture data usage by tech firms and agribusinesses may also reveal its role in facilitating the financialization of agriculture (c.f. Clapp 2014; Isakson 2014; Vander Stichele 2015; USAID 2016). Financial capitalists must be able to “accurately” assess risk, and price financial instruments and/or speculative purchases accordingly. However, this must be done from their positions in cities—that is, from a distance. Digital agriculture may provide the necessary information they need. The risk profiles of farmers can be more easily determined. Speculation on futures markets can be priced more confidently. The prices offered farmers in contract deals can be set to the advantage of agribusinesses. The knowledge needed to invest in land may be more easily assembled (Li 2014). The agricultural sector can be grasped at larger and larger scales, facilitating financial inflows at all levels, across all actors—producers, input providers, water providers, traders, processors, and so forth. Like all politi-

cal-economic actors at a non-local scale, financial capitalists demand legibility—and computed data, provided by digital agriculture, may provide it.

Finally, digital agriculture demands an analysis of its neocolonial functions in late capitalist globalization. In this paper we have extended the critique of digital agriculture through the perspective of urbanization's concentration and extension. Many scholars have pointed out the relationship between the early modern development of non-agrarian economic sectors, the growth of cities, and colonialism. While generative, the urban lens by itself is incomplete for examining how digital agriculture lays the groundwork for extraction from the periphery and accumulation in the "center." Digital agriculture appears differently in the Global South than in the Global North, and as of yet, most literature on the topic focuses on the northern manifestation, which primarily involves precision agriculture equipment. This paper takes an initial look at the tools, including e-extension and smallholder management, digital agriculture deploys in the Global South, but much more is needed. A specific focus on the Global South is necessary, though, not only because of differences in technologies but also and especially for reasons of colonial legacy. Scholars have identified the colonial and neo-colonial origins of some tools used in digital agriculture and the development organizations that are now promoting digital agriculture in the Global South, but little to none has been written about the neo-colonial functioning of digital agriculture as an industry. Megan Black (2018), for example, writes about Landsat imagery, which is frequently used today to read agricultural field conditions: "American and Interior officials in the 1960s . . . sought to bring the mineral-rich interiors of the Third World into global circulation" (185). Her account, however, focuses on mineral extraction in the pre-digital agriculture era.

Such an analysis should assess not only the extractive effect of external technologies, but also the radical potential of locally-developed and scaled digital agriculture tools. In 1961, Fanon understood the need for re-centering agricultural knowledge within formerly colonized lands, and declared the need for a post-colonial agronomy. Digital agriculture may present an opportunity for this new science to take root.

The soil needs researching as well as the subsoil, the rivers why not the sun. In order to do this, however, something other than human investment is needed. It requires capital, technicians, engineers and mechanics, etc. Let us confess, we believe that the huge effort demanded of the people of the underdeveloped nations by their leaders will not produce the results expected. If working conditions are not modified it will take centuries to humanize this world...(Fanon 1963, 57).

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References

- Ajl, Max. 2014. "The Hypertrophic City Versus the Planet of Fields." In *Implosions/Explosions* edited by Neil Brenner, 533–50. Berlin: Jovis Berlin.
- Araghi, Farshad A. 1995. "Global Depeasantization, 1945–1990." *The Sociological Quarterly* 36 no. 2: 337–68.
- Araghi, Farshad A. 2000. "The Great Global Enclosure of Our Times: Peasants and the Agrarian Question at the End of the Twentieth Century." In *Hungry for Profit: The Agribusiness Threat to Farmers, Food, and the Environment* edited by Frederick H. Buttel, Fred Magdoff and John Bellamy Foster, 145–60. New York: Monthly Review Press.
- Arboleda, Martín. 2016. "Spaces of Extraction, Metropolitan Explosions: Planetary Urbanization and the Commodity Boom in Latin America." *International Journal of Urban and Regional Research* 40, no. 1: 96–112.
- Barbieri, Lindsay, Sonya Ahamed, and Sam Bliss. 2019. "Farming within limits." *Interactions* 26, no. 5 (August): 70–73.
- Black, Megan. 2018. *The Global Interior: Mineral Frontiers and American Power*. Cambridge: Harvard University Press.
- Borras, Saturnino M. Jr, Ruth Hall, Ian Scoones, Ben White, and Wendy Wolford. 2011. "Towards a better understanding of global land grabbing: An editorial introduction." *Journal of Peasant Studies* 38, no. 2: 209–16.
- Brenner, Neil. 2013. "Theses on Urbanization." *Public Culture* 25, no. 1: 85–114.
- Brenner, Neil. 2016. "The Hinterland Urbanised?" *Architectural Design* 86, no. 4: 118–127.
- Brenner, Neil, and Christian Schmid. 2014. "The 'Urban Age' in Question." *International Journal of Urban and Regional Research* 38, no. 3: 731–55.
- Brenner, Neil and Christian Schmid. 2015. "Towards a New Epistemology of the Urban?" *City* 19, no. 2–3: 151–82.
- Bronson, Kelly. 2018. "Smart Farming: Including Rights Holders for Responsible Agricultural Innovation." *Technology Innovation Management Review* 8, no. 2: 7–14.
- Bronson, Kelly. 2019. "Looking through a Responsible Innovation Lens at Uneven Engagements with Digital Farming." *NJAS - Wageningen Journal of Life Sciences* 90 (April).
- Bronson, Kelly and Irena Knezevic. 2016. "Big data in food and agriculture." *Big Data & Society* 3, no. 1 (June).
- Carolan, Michael. 2018. "Big Data and Food Retail: Nudging out Citizens by Creating Dependent Consumers." *Geoforum* 90 (March): 142–50.
- Carolan, Michael. 2020. "Automated agrifood futures: robotics, labor and the distributive politics of digital agriculture." *Journal of Peasant Studies* 47, no. 1: 184–207.
- Castells, Manuel. 2010. *The Rise of the Network Society* 2nd ed. Chichester, West Sussex ; Malden, MA: Wiley-Blackwell.

- Clapp, Jennifer. 2014. "Financialization, Distance and Global Food Politics." *Journal of Peasant Studies* 41, no. 5: 797–814.
- Davis, Mike. 2001. *Late Victorian Holocausts: El Niño Famines and the Making of the Third World*. London ; New York: Verso.
- Devereux, Stephen. 2001. "Sen's Entitlement Approach: Critiques and Counter-critiques." *Oxford Development Studies* 29, no 3: 245–262.
- Eastwood, Caroline, Laurens Klerkx, Margaret Ayre, and B. Dela Rue. 2019. "Managing Socio-Ethical Challenges in the Development of Smart Farming: From a Fragmented to a Comprehensive Approach for Responsible Research and Innovation." *Journal of Agricultural and Environmental Ethics* 32 (December): 741–768.
- Fanon, F. 1963. *The Wretched of the Earth*. New York: Grove Press.
- Fard, Ali. 2018. *Grounding the Cloud*. Doctoral Dissertation, Harvard University.
- Finistere Ventures. 2018. "2018 Agtech Investment Review." Pitchbook.
- Fraser, Alistair. 2019. "Land grab/data grab: Precision agriculture and its new horizons." *The Journal of Peasant Studies* 46, no. 5: 893–912.
- Grant, Elliott. 2019. "Entering the era of computational agriculture." X Blog, Medium.com. March 19, 2019.
- Hunger, Francis. 2018. "Epistemic Harvest: The Electronic Database as Discourse and Means of Data Production." *A Peer-Reviewed Journal About* 7, no. 1: 52–65
- IPES-Food. 2017. "Too big to feed: Exploring the impacts of mega-mergers, concentration of power in the agri-food sector." Edited by Chantal Clément and Nick Jacobs.
- Isakson, S. Ryan. 2014. "Food and Finance: The Financial Transformation of Agro-Food Supply Chains." *The Journal of Peasant Studies* 41, no. 5: 749–75.
- Janger, Matt. 2018. "The transformer of autonomous farmbots can do 100 jobs on its own." *Wired*, March 9, 2018. <https://www.wired.com/story/dot-power-autonomous-farming/>
- Latour, Bruno. 1993. *We Have Never Been Modern*. Cambridge, MA: Harvard University Press.
- Lazzarato, Maurizio. 1996. "Immaterial labor." In *Radical Thought in Italy: A Potential Politics* edited by Paolo Virno and Michael Hardt, 142–157. Minneapolis: University of Minnesota Press.
- Lehe, Jonathan. 2019. "Improving Smallholder Farmers' Livelihoods through Mobile Phone-Based Agricultural Advice." Presentation at the Harvard Kennedy School of Government, April 5, 2019.
- Li, Tania Murray. 2014. "What is Land? Assembling a Resource for Global Investment." *Transactions of the Institute of British Geographers* 39, no. 4: 589–602.
- Lioutas, Evangelos D., Chrysanthi Charatsari, Giuseppe La Rocca, and Marcello De Rosa. 2019. "Key Questions on the Use of Big Data in Farming: An Activity Theory Approach." *NJAS - Wageningen Journal of Life Sciences* 90–91 (December): 100297.
- Lombardo, Stefania, Daniele Sarri, Luigi Corvo, Marco Vieri. 2017. "Approaching the fourth agricultural revolution: analysis of needs for the profitable introduction of smart farming in rural areas." HAICTA.
- Lowder, Sarah K., Jakob Skoet, and Terri Raney. 2016. "The Number, Size, and Distribution of Farms, Smallholder Farms, and Family Farms Worldwide." *World Development* 86: 16–29.

- Lowenber-DeBoer, Jess. 2015. "The precision agriculture revolution: making the modern farmer." *Foreign Affairs* 94, no. 3: 105–112.
- Markovits, D. (2019). *The Meritocracy Trap: How America's Foundational Myth Feeds Inequality, Dismantles the Middle Class, and Devours the Elite*. New York: Penguin Random House.
- McMichael, Philip. 2012. "The land grab and corporate food regime restructuring." *The Journal of Peasant Studies* 39, no. 3–4: 681–701.
- Merrifield, Andy. 2011. "The Right to the City and Beyond." *City* 15 no. 3–4: 473–481.
- Monte-Mór, R.L.M. 2004. "Modernities in the jungle: extended urbanization in the Brazilian Amazon." Unpublished PhD dissertation, Department of Urban Planning, University of California Los Angeles, Los Angeles, CA.
- Moore, Jason W. 2010. "The End of the Road? Agricultural Revolutions in the Capitalist World-Ecology, 1450–2010." *Journal of Agrarian Change* 10, no. 3: 389–413.
- Moore, Jason W. 2014. "The End of Cheap Nature. Or How I Learned to Stop Worrying about 'The' Environment and Love the Crisis of Capitalism." In *Structures of the World Political Economy and the Future of Global Conflict and Cooperation*, edited by Christian Suter and C Chase-Dunn, 285–314. Berlin: LIT.
- Morozov, E. 2019. "It's not enough to break up big tech. We need to imagine a better alternative." *The Guardian*, May 11, 2019.
- Patel, Raj, and Jason W. Moore. 2017. *A History of the World in Seven Cheap Things: A Guide to Capitalism, Nature, and the Future of the Planet*. Oakland, California: University of California Press.
- Patel, Raj. 2013. "The Long Green Revolution." *Journal of Peasant Studies* 40, no. 1: 1–63.
- Precision Agriculture for Development. 2019. "Q2 2019 Quarterly Report."
- Resnikoff, Howard L. 1988. *The Illusion of Reality*. New York: Springer-Verlag.
- Revich, Jerry, Robert Koort, Patrick Archambault, Adam Samuelson, Michael Nannizzi, Mohammed Moawalla, and Andrew Bonin. 2016. "Precision Farming: Cheating Malthus with Digital Agriculture." *Profiles in Innovation*. Goldman Sachs.
- Rotz, Sarah, Evan Gravely, Ian Mosby, Emily Duncan, Elizabeth Finnis, Mervyn Horgan, and Joseph LeBlanc. 2019. "Automated Pastures and the Digital Divide: How Agricultural Technologies Are Shaping Labour and Rural Communities." *Journal of Rural Studies* 68 (May): 112–22.
- Sadowski, Jathan. 2020. "The internet of landlords: Digital platforms and new mechanisms of rentier capitalism." *Antipode* 52, no. 2: 562–580.
- Sarkar, Swagato. 2014. "Contract Farming and McKinsey's Plan for Transforming Agriculture into Agribusiness in West Bengal." *Journal of South Asian Development* 9 (December): 235–51.
- Sassen, Saskia. 1991. *The Global City: New York, London, Tokyo*. Princeton University Press, Princeton, NJ.
- Sassen, Saskia. 1998. *Globalization and Its Discontents*. New York: The New Press.
- Scanlan, Stephen J., J. Craig Jenkins, and Lindsey Peterson. 2010. "The Scarcity Fallacy." *Contexts* 9, no. 1: 34–39.

- Scoones, Ian, Blasio Mavedzenge, Felix Murimbarimba, and Chrispen Sukume. 2018. "Tobacco, Contract Farming, and Agrarian Change in Zimbabwe." *Journal of Agrarian Change* 18, no. 1: 22–42.
- Sen, Amartya. 1977. "Starvation and Exchange Entitlements: A General Approach and Its Application to the Great Bengal Famine." *Cambridge Journal of Economics* 1, no. 1: 33–59.
- Shepherd, M., Turner, J.A., Small, B., and Wheeler, D. 2018. "Priorities for science to overcome hurdles thwarting the full promise of the 'digital agriculture' revolution." *Journal of the Science of Food and Agriculture*, early access.
- Soja, Ed. 2010. Regional urbanization and the end of the metropolis era. In G. Bridge and S. Watson (eds.), *The new Blackwell companion to the city*, Blackwell, Cambridge, MA.
- Stone, Glenn D. 2007. "Agricultural Deskillling and the Spread of Genetically Modified Cotton in Warangal." *Current Anthropology* 48, no. 1: 67–103.
- Stone, Glenn D. 2010. "Contradictions in the Last Mile: Suicide, Culture, and E-Agriculture in Rural India." *Science Technology & Human Values* 35.
- Trendov, Nikola M., Samuel Varas, and Meng Zeng. 2019. "Digital technologies in agriculture and rural areas." Food and Agriculture Organization of the United Nations Briefing Paper. Rome.
- USAID. 2016. "Guide to the Use of Digital Financial Services in Agriculture." Washington, DC.
- Van der Burg, Simone, Marc-Jeroen Bogaardt, and Sjaak Wolfert. 2019. "Ethics of Smart Farming: Current Questions and Directions for Responsible Innovation towards the Future." *NJAS - Wageningen Journal of Life Sciences* (March): 100289.
- Vandeman, Ann M. 1995. "Management in a bottle: Pesticides and the deskillling of agriculture." *Review of Radical Political Economics* 27, no. 3: 49–59.
- Vander Stichele, Myriam. 2015. "How financialization influences the dynamics of the food supply chain." *Canadian Food Studies / La Revue Canadienne Des Études Sur L'alimentation*, 2, no. 2: 258–266.
- Webster, Frank. 2002. *Theories of the Information Society*. Cambridge: Routledge.
- Weersink, Alfons, Evan Fraser, David Pannell, Emily Duncan, and Sarah Rotz. 2018. "Opportunities and Challenges for Big Data in Agricultural and Environmental Analysis." *Annual Review of Resource Economics* 10, no. 1: 19–37.
- Weis, Tony. 2010. "The Accelerating Biophysical Contradictions of Industrial Capitalist Agriculture." *Journal of Agrarian Change* 10, no. 3: 315–41.
- World Bank. 2019. "Future of Food Harnessing Digital Technologies to Improve Food System Outcomes." Washington, DC.

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MELISA KRNJAIC

Swept Aside: Analyzing the Effectiveness of Homeless Sweeps in the Bay Area

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