
Contemporary Megaprojects

An Introduction

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■ **ABSTRACT:** There is renewed interest in megaprojects worldwide. In contrast to high-modernist megaprojects that were discrete projects undertaken by centralized authorities, contemporary megaprojects are often decentralized and pursued by a range of stakeholders from governments as well as the private sector. They leverage cutting-edge technology to ‘see’ complex systems as legible and singular phenomena. As a result, they are more ambitious, more pervasive and they have the potential to reconfigure longstanding relationships that have animated social and ecological systems. The articles in this issue explore the novel features of contemporary megaprojects, they show how the proponents of contemporary megaprojects aspire to technologically enabled omnipresence, and they document the resistance that megaprojects have provoked.

■ **KEYWORDS:** Megaprojects, environment, governance, planning, science and technology, resistance

The Chinese Government announced the Belt and Road Initiative in 2013, and since then, more than 130 countries have embraced its vision of a Sinocentric expansion of global production and trade networks. Chinese President Xi Jinping highlighted the Belt and Road Initiative’s unprecedented scale and scope when he hailed it as the “project of the century” (Dunford and Liu 2019). The Belt and Road Initiative is indeed emblematic of contemporary megaprojects, and there are other large-scale infrastructure initiatives geared toward continental integration such as the Greater Mekong Subregion, the Lamu Port –South Sudan–Ethiopia Transport Corridor, and the Initiative for the Integration of the Regional Infrastructure of South America.

As the cover photograph of this volume indicates, however, megaprojects are not necessarily manifested through the construction of infrastructure. That image was taken in 2010 in Laos, and the barren vista that extends to the horizon presages the construction of what Miles Kenney-Lazar and Noboru Ishikawa (this volume) refer to as a “mega-plantation.” The production of mega-plantations across Southeast Asia is decentralized, yet the constituent components cohere into the regional proliferation of monoculture agro-industrial landscapes. This is an order of magnitude greater than earlier modes of plantation and industrial agriculture that fundamentally alters long-standing ecologies, biodiversity, and social relations.



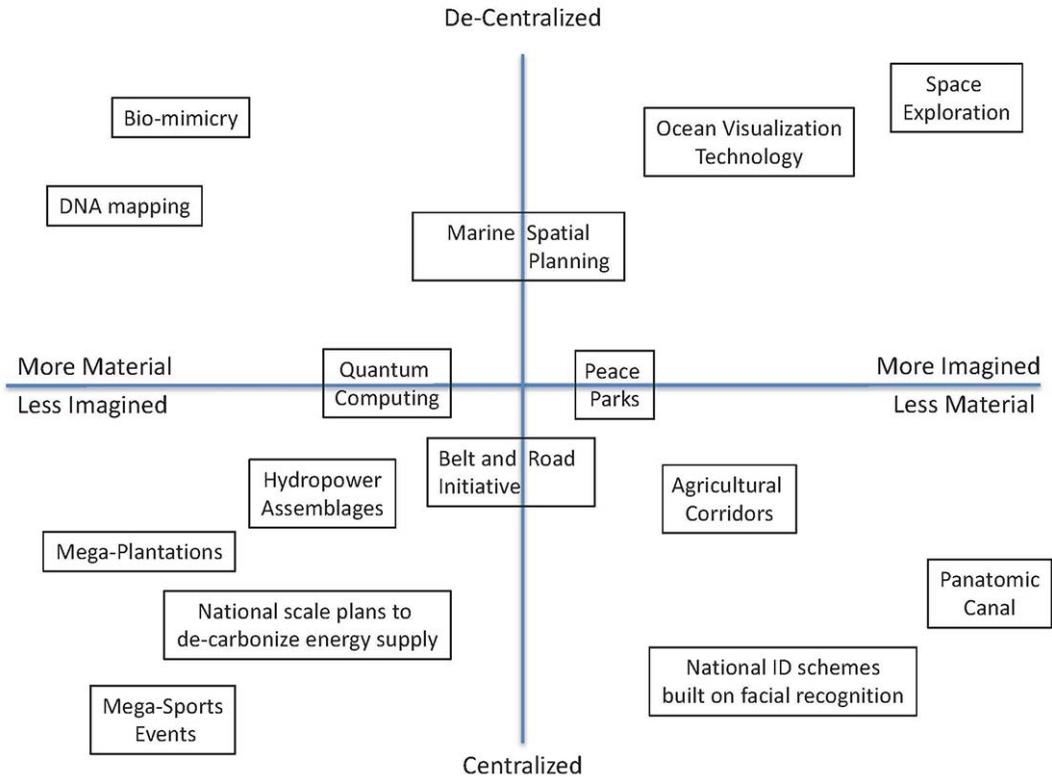
The decentralized nature of many contemporary megaprojects separates them from high modernist schemes that imbued states and planners with omnipotence to “see” and manipulate their environments (Scott 1998). The centralized nature of planning in the postwar era imposed limits on what could be envisioned and undertaken. Indeed, the ambition of planners was blunted by their inability to exercise power on the ground, and/or fiscal and political limitations imposed by central government authorities. With the neoliberal turn in the 1980s, planners were greatly disempowered, and in many countries, the envisioning of megaprojects was limited to those that could at least be partially funded by the private sector.

The articles in this volume suggest megaprojects are once again on the political agenda of states and international institutions, but this has not crowded out non-state actors. On the contrary, a host of non-state actors play an integral role in contemporary megaprojects, and this diffused authority, action, and responsibility allows for (1) projects of unprecedented scale and scope to be envisioned and undertaken, and (2) entirely new ways of “seeing” territory and populations. Given that the scope, complexity, and organization of megaprojects have changed, it is helpful to distinguish axes of difference. We identify three, two of which are shown in Figure 1.

The horizontal axis captures the fact that megaprojects are not just things that change landscapes and infrastructure. They cannot only be measured in tons of concrete or earth moved. Megaprojects are imagined before they come to exist—and many only exist as figments of imagination. And yet their prospect can have material effects for decades. As projects progress, they may move further to the left of the axis. They become more material—but not always. Some aspirational projects (space exploration, the colonization of Mars) will continue to have grandiose ambitions whatever their realization. Other projects, because they are more decentralized (again, mega-plantations are a good example), are less imagined and unfold incrementally in real time.

The vertical axis captures the extent to which particular projects are centrally organized or diffusely planned. Megaprojects have traditionally been understood as singular discrete undertakings distinguished by their cost and complexity. It is only for that reason that they can so often be delayed and go over budget (Flyvbjerg 2014). But these days, with so many participants, there may not be a single timetable, or indeed a single budget to exceed. In this volume, we include decentralized projects purposefully undertaken by a myriad of actors, sometimes with little or no coordination, whose influence is cumulative and has the potential to fundamentally transform longstanding relationships that have animated social and ecological systems. To return to the mega-plantation example, the actors involved pursue a shared set of objectives and employ a singular body of expertise. Their myriad and quotidian actions result in the regularization of agro-industrial production whose far-reaching impacts and the expansiveness of its landscapes constitute a megaproject despite the absence of centralized coordination.

Note that some large diffuse projects, such as mapping the human genome, which was a large-scale exercise taken across many different units, can look more centralized and controlled as we zoom in on particular parts of the enterprise. Furthermore, the extent of centralized control is not fixed and can change over time. Taken together, these axes allow us to map contemporary megaprojects. We have mapped the different megaprojects referred to in this collection, as well as others with which we are familiar. The bottom left-hand corner—material changes brought about by central planning—has typically been the space for megaprojects. But the framework captures the fact that the nature of megaprojects has changed. As this collection and other examples show, contemporary megaprojects are more pervasive, ambitious, and decentralized than their antecedents. The top right corner is full of diffuse, imagined projects in which different elements coalesce together and transform, or intend to transform, our societies, environments, and discourse.

Figure 1: Axes of Difference in Contemporary Megaprojects

The final axis (not shown on this graph) is that of scale. Megaprojects can vary from the molecular (quantum computing, CERN) to the planetary and beyond (space exploration). They can cover vast areas and be concerned with the smallest entities. We have not portrayed scale in this diagram, as it would become hard to read, but it is easy to envisage it forming a third axis. The point here is that “mega” can mean vast in scope in traditional human terms. But megaprojects can also be intensely intimate and intricate. The common denominator to both is that they have transformative potential and will still absorb hundreds of millions of dollars and many years of labor time.

Turning to the articles themselves, Ashley Carse and David Kneas’s premise is that many megaprojects do not actually happen. They may be imagined and planned but never break ground; or, if they do, construction may be stalled or never completed. And yet, they have can great significance, regardless, reshaping politics, landscapes, social experiences, and affective states. Nevertheless, Carse and Kneas contend that academics have insufficiently incorporated the unbuilt and imagined into their theories of why and how infrastructure matters. They suggest a crucial way of understanding incomplete megaprojects is through “timescapes” (following Bear), in which different understandings and experiences of time coalesce into “time-knots” (following Chakrabarty). The authors offer a series of heuristic devices with which to examine the time-knots of unbuilt and unfinished infrastructures: “shadow histories, present absence, suspended presents, nostalgic futures, and zombies.” “Shadow histories”—the histories of things that did not happen, such as the Trans-Saharan Railway, the Panatomic Canal (to have been constructed by detonating two hundred large nuclear warheads), or Atlantropa (the project to dam, and drain, the Mediterranean Sea)—offer insights into the contingencies of the present.

“Nostalgic futures” point to the remembered promises and aspirations that once accompanied a project. “Present absence” refers to the consequences of failed, incomplete, or withdrawn projects. “Suspended presents” capture the transformations of daily life associated with experiences of delay, from hope to disillusionment. The Kaeng Suea Ten Dam in Thailand has threatened the eviction of communities for nearly four decades, without ever yet materializing. The “zombie” heuristic, on the other hand, draws attention to putative projects that, while never quite suspending daily life by their imminence, also never quite go away.

Veronica Davidov shows how biomimicry serves as an inspirational source for the optimization of technologies such as robotics and industrial design. Nature is thus constructed as an abundant mega-resource. However, biomimicry as an “epistemic object” does not entail a homogenous field. Rather, it coheres in a variety of ways in different disciplines. For example, it can be regarded as a philosophical object, it can be debated ethically, or it can be understood as a design praxis and method. Moreover, there are several practices—such as a strand of geoengineering known as SRM and the practice of trophic rewilding—that might not officially be categorized as biomimetic but would fall within the scope of biomimicry and should be explored within the field to underline its potentials and implications. Davidov suggests the most fruitful way of engaging with biomimicry is to situate it within broader social, political, and economic contexts in order to understand its epistemic and economic merits and the challenges it poses. Multiple ethnographies of biomimetic projects would enable such critical encounter.

John Lauermaun shows how sports mega-events—which have long been touted as transformative—have become increasingly contested and controversial. There is a growing cleavage between the proponents and opponents of these events. Claims made by supporters that emphasize their long-term benefits are met by skepticism and protests. Lauermaun traces and compares the scholarly literature on these two fronts of urban politics. Advocates of these mega-events build their argument on the fact that, after a few weeks of elite use of urban space, the infrastructure can be used by ordinary residents, or they emphasize the potential of these projects beyond obvious goals such as the possibility of influencing other institutional platforms or programs. However, as Lauermaun demonstrates, the recent surge of protests and resistance against these events challenges this narrative. These mobilizations are temporary political campaigns, referred to as “fast activism,” and have been increasingly successful in forcing cities to cancel bids.

Kenney-Lazar and Ishikawa have reviewed the emergence and development of monoculture agro-industrial plantations across Southeast Asia. They demonstrate how these projects have led to displacement and replacement of preexisting human and nonhuman communities. Although the ideological driver of these projects dates back to the colonial period, they explore the origin of “mega-plantations,” whose emergence is more recent. The proliferation of mega-plantations has led to widespread displacement and dispossession, and they have been accompanied by far-reaching environmental impacts such as deforestation, forest fires, and air pollution. Despite diversification of political strategies and increased numbers of strikes, protests, and multiple forms of everyday resistance by different groups of people, the expansion of land incorporated into mega-plantation continues for the foreseeable future.

Serena Stein and Marc Kalina interrogate agricultural growth corridors, a strategy meant to foster rural development in the Global South, and demonstrate how they are imagined and experienced on an everyday basis. The “corridors” are rooted in colonial history and developmental trajectories of the mid-twentieth century. However, only within the past decade have the agricultural growth corridors spread across the Global South. These megaprojects combine infrastructure investment with agribusiness across borders and regions and mostly emerged in Africa after the 2008 crisis of food, fuel, and finance. Their proponents anticipate that through

the integration of smallholder farmers to national, regional, and international production networks, these corridors reduce poverty and provide food security. However, as research has shown, they disrupt smallholder farmers' operations and their access to food. They also block shared resources such as water for communities and raise several issues around land access. Hence, these projects have been fiercely contested by various civil society groups and social movements. The authors encourage future research to give situated attention to processes of becoming in these projects and the ways people experience them on the ground.

Grant Gutierrez and colleagues argue hydropower projects should be understood not as singular infrastructure projects but instead as global assemblages with specific relations to networks of power. Also, they suggest understanding different forms of engagement and the significance ascribed to hydropower projects by different actors is a more meaningful way of understanding these projects. For most of their history, large hydropower projects have been embedded in hegemonic modernist and nationalist projects and were considered one of the most important pathways to modernization. However, their long-term negative social and ecological impacts provoked different forms of contestation and conflict locally and transnationally. While these movements in their early years set the stage for the emergence of one of the first grassroots ecological movements in the Global South, a large alliance of transnational anti-dam groups have recently popularized the slogan "Water is life" to emphasize the interlinkage between water and power. In its latest phase, small hydropower projects are initiated in the name of support for renewable energy, greenhouse gas emissions, and economic development despite opposition of scientists and activists.

Luke Fairbanks and colleagues are concerned with new marine spatial planning (MSP) projects across the world as a new ocean governing strategy. MSP focuses on combining and managing traditionally disconnected individual sectors such as fishing and shipping through an overarching system of governance. MSP projects purportedly contribute to a socioecological harmony between individual sectors and contribution to broader goals of sustainable development. The authors highlight four key elements of MSP: planning discourse, ocean economies, online data, and new networks of ocean actors. Critical insights are provided from a MSP initiative in the United States to explore the interconnections between the four elements. The authors also show that MSP differs from classic megaprojects in a variety of ways, such as its infrastructure and political and social visibility. They conclude the article with a call to work on critical and radical thought such as relational theory and political ecology, among others. This, they argue, would enable an examination of different scopes and scales of MSP assemblages. Moreover, the authors suggest different strands of critical scholarship should be put in dialogue with each other in order to reexamine the implications of these projects.

Stephanie Ratté narrates the novel ways in which a range of actors are leveraging cutting-edge technology that renders oceans knowable and measurable. She shows this is a highly decentralized project undertaken by actors whose objectives are occasionally in conflict. For example, the transformation of oceans from a vast unknown wilderness to a legible and catalogued space is a goal pursued by those hoping to exploit this frontier's resources, as well as by conservationists. Ratté argues that one consequence of transforming this unknown frontier into a singular topographical space is that humans—and their impacts on maritime ecosystems—are obscured.

Micha Rahder focuses on imaginaries of outer space. Fears of environmental and sociopolitical catastrophes have within recent decades encouraged two interconnected forms of imaginaries, which in this article are referred to as Earth 2.0 and ecocentric imaginaries. According to the author, those in search of Earth 2.0 are looking to create an improved human future through different kinds of technological innovations, while the ecocentric narratives go beyond human timescales and present imaginaries based on evolutionary ecologies that defy human excep-

tionalism and their mastery on/of the planet. Rahder compares these imaginaries and discusses their implications for the future of life after Earth. Earth 2.0 imaginaries motivate investments, focus on the present, and in most cases ignore the inherent inequalities linked with such an imaginary. In contrast, ecocentric imaginaries focus on interrelations and commonalities and do not aim at reasserting domination or control on Earth. The author suggests both approaches should become more sensitive to politics related to the particularity of their imaginaries.

This collection demonstrates several trends. First, new sources of finance are bankrolling megaprojects. We began this introduction with a discussion of the Belt and Road Initiative, and China is one emergent source of megaproject finance. After the 2008 financial crisis, China “combined huge government spending with a spectacular loosening of monetary policy” and “for the first time in the modern era, it was the movement of the Chinese economy that carried the world economy” (Tooze 2018: 249, 251). The US Department of the Treasury embarked on an equally deliberate fiscal stimulus package meant to calm investors and bolster markets. The result has been a decade of cheap capital that has often been funneled into megaprojects.

While capital may become more expensive, there seems to be a durable appetite for megaprojects among a diverse group of financiers and investors. There are hard economic drivers behind this appetite. As Sarah Bracking (2016) has argued, megaprojects provide a means by which the “great predators” of capitalism extract huge revenues from states. These they derive both from the construction of things and from the contracts to run and maintain them, which provide revenue streams that can then be financialized. As Ashwin Desai (2016) put it (writing of the World Cup in South Africa): “Global finance capital . . . thrives in a world of large-scale investment in mega-projects, mega-events, and the short-term investment, long-term debt, and creative financing associated with them” (cited in Bracking 2016: 94). The economic gains fuel the establishment of a social field in which megaprojects are highly valued. Just as high modernism had its priests and practitioners who operated in a rather rarefied and insular field, megaproject planning is validated within an emergent social field animated by global networks of professionals who contribute to the production of a body of knowledge and activate finance for undertakings that can only be described with superlatives.

This is not uncontested, and resistance to megaprojects takes many forms. The most obvious example is the refusal to allow the construction of particular infrastructure, but this is difficult when megaprojects are diffuse. Quite simply, villagers in Laos may block a single mega-plantation, but they are unlikely to hold back the unrelenting tide of agro-industrial production that threatens to sweep away everything before it. Thus, another form of resistance that is less visible but just as important is the undermining of the epistemic justification for the constituent components of decentralized megaprojects.

Finally, the articles in this collection raise a series of questions that can be taken up in future research on megaprojects. First, what are the objects upon which proponents of megaprojects seek to act? While social engineering was typically among the objectives of high modernist projects, it has not been emphasized by the articles in this volume. That is not to say people are not impacted by megaprojects. Rather, the “improvement” of “deviant” or “abnormal” target populations (Li 2007) is not an explicit goal of megaproject proponents. Instead, the transformation of territory seems to be an overriding priority of contemporary megaprojects, one result of which is ostensibly the improvement of the well-being of local residents. To take the example of growth corridors (Stein and Kalina, this volume), they are not meant to act directly on target populations; rather, local farmers will supposedly benefit, as transportation infrastructure will afford them improved access to markets. Thus, the megaproject provides peasants with the opportunity to act entrepreneurially, but they are ultimately responsible for their own “improvement.”

Second, how do the diffused networks of actors that undertake megaprojects “see” the spaces, people, and landscapes upon which they act? One theme that came out several articles in this volume was the recent technological advancements to “see” people and things as data. The codification of vast amounts of information into ones and zeros can itself be a megaproject, and at other times, it enables megaprojects. Just as Shoshana Zuboff (2015) argued that the aggregation of a vast amount of data has allowed for human experience to be reduced to more measurable “behavior,” technological advancements in a range of fields allow for entirely new modes of grappling with what Timothy Morton (2013) refers to as “hyperobjects.” The contributions in this volume demonstrate that a host of actors are applying recently developed technologies in attempts to render legible the incomprehensible vastness of oceans and outer space. Thus, there is a desire to smash epistemological as well as ontological boundaries, which may indeed be a fundamental human trait, but what is new about the contemporary ways of seeing and knowing is that they are informed by aspirations of technologically enabled omnipresence.

Will contemporary megaprojects totalize experience and catalogue all existing relationships among people and things? Or will they nevertheless exclude certain places, people, and things? How will people remain illegible, and will this be though their own volition? And how do these modes of seeing and knowing activate new relationships and behavior? These are the questions opened up by this collection of articles.

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