Chapter 1

MEGAPROJECTS AND SUSTAINABLE INFRASTRUCTURE: AN HISTORICAL OVERVIEW

ABSTRACT: *This chapter introduces the most relevant concepts on the need of a framework for sustainable infrastructure and megaprojects discussing both empirical evidence and theoretical reflections, focusing especially on the social and institutional dimensions alongside the environmental and economic ones. As megaprojects and infrastructure represent the backbone of every developed society and nation, and due to the climate crisis, the transition toward sustainable infrastructure, as also promoted by the United Nations and the SDG 9 (Industry, Innovation and Infrastructure), is nowadays more urgent than ever. This first chapter, drawing on existing scientific and grey literature, provides the wider framework adopted in this book highlighting the urgency of including the social component, both in terms of engaged stakeholders and of infrastructure governance, in every future megaproject and infrastructural project.*

1.1. Megaprojects in a nutshell

Megaprojects are generally intended as "*large-scale, complex ventures that typically cost US$1 billion or more, take many years to develop and build, involve multiple public and private stakeholders, are transformational, and impact millions of people*" (Flyvbjerg, 2014, p. 6). Therefore, in other words, megaprojects are large – either in terms of budget, long lifespan and geographical area – projects with several impacts on the society and the environment. Despite the commonly used prefix Mega, strictly speaking, megaprojects should be defined as Giga or Tera projects due to their budget order of magnitude of billions of euros (mega refers to millions). Megaprojects include a wide array of infrastructural projects required by our society. These include transportation infrastructure such as airports, high-speed railway (HSR) and large train stations or harbors (Esposito et al., 2021), industrial and mining facilities (Brahm & Tarziján, 2015), temporary events such as the Olympic Games (Randeree, 2014; Shakirova, 2015; Sroka, 2021),

energy facilities such as large renewable power plants (Stone, 2008) or large research centers such as the CERN (Krige, 1994) or ITER project (Coblentz, 2019). Infrastructure, either large or not, may be classified into networked or non-networked infrastructure (i.e. connected or non-interconnected with other infrastructure). Non-networked infrastructure includes all infrastructure that is not interconnected and necessary to other infrastructure (e.g. a house), while networked infrastructure includes that necessary to develop all the others (e.g. an energy power plants or a transportation hub). More specifically, non-networked infrastructure includes, among others, 1) housing and shelter, 2) healthcare centers, 3) schools, 4) markets, 5) industrial facilities, 6) community centers, 7) courts and prisons, 8) government buildings, while networked infrastructure refers to energy, transport, water, solid waste and digital communication facilities (Thacker et al., 2018).

Due to its crucial role for the (sustainable) development of every country in the world, in the last decades infrastructure experienced a huge increase in investment (Ma et al., 2020) and enormous investments are needed to build the necessary infrastructure to support national development. The OECD estimates that an average investment of around USD 6.9 trillion per year is required at the global level to support the development of adequate infrastructure before 2030 (to achieve the goals of the Agenda 2030) (NCE, 2016). In contrast, the current spending for infrastructure globally reaches USD 3.4 trillions per year, which is less than the 50% of what would be necessary to develop the required infrastructure to fulfil the Agenda 2030. To understand the scale of the phenomenon, the required investment before 2030 is more than USD 90 trillion, which is more than the total past investment and market value of all global infrastructure (OECD, 2019a). The order of magnitude of investments is clearly depicted, for instance, by the "*China-Pakistan Economic Corridor*" (CPEC). The CPEC is part of the global Chinese transportation strategy, the Belt and Road Initiative (Lu et al., 2018), which consists in the development of the new "*silk road*" that will connect China with the majority of the countries in the world through maritime and terrestrial pathways. To build the CPEC, the Pakistani part of the Belt and Road initiative, more than USD 60 billion will be necessary, which represents an amount larger than all of Pakistan's infrastructure investments until today (Thacker et al., 2019). Such an amount (i.e., USD 90 trillion) is therefore necessary either to renovate and replace old infrastructure and to build new one, especially in developing countries (around 60% of the total investment) which still need to develop and build its basic networked infrastructure (NCE, 2016).

Beyond the need to develop the minimum amount of required infra-

structure, both to stimulate economic growth of countries and to achieve sustainable development according to the Agenda 2030, the reason to invest in megaprojects is not so straightforward. Indeed, in the past decades, megaprojects have been widely contested (Adityanandana & Gerber, 2019; Teo & Loosemore, 2010; van Marrewijk et al., 2016) for their huge negative environmental impacts, on local community and territory, for the sake of a better national or international, for instance, transportation or energy systems, *de facto* sacrificing the local common good and identity of territories and communities for a "superior" benefit.

Numerous examples, such as the social and environmental effects brought on by large-scale construction projects like the Three Gorges Dam (Li et al., 2013; Stone, 2008; Yang et al., 2007) or the Qinghai-Tibet Railway (Qiu, 2007), which have the potential to permanently alter the natural ecosystem and have an impact on the quality of life for millions of people, are well-known. The dam known as the Three Gorges is the largest hydroelectric power plant in the world. It was constructed across three valleys in China, forcing more than a million people to leave their homes. In addition to this, the dam had a number of detrimental environmental effects by permanently altering the natural ecosystem and resulting in a decline in water quality and a loss of biodiversity (Li et al., 2013). Inaugurated in 2006, the Qinghai-Tibet Railway (Qiu, 2007), instead, connects the interior of China with Lhasa, the capital of Tibet, and is the highest railway in the world (it exceeds 5,000 m above sea level). The project caused significant concern in the local and global communities since it was perceived as a neo-colonial infrastructure, rather than just a transportation infrastructure.

1.1.1. From individual to collective sublimes: toward the definition of a fifth sublime

Due to such social concerns and (eventual) negative environmental impacts (but not only), megaprojects, indeed, remain a high-risk investment both for private organizations and public institutions. If, on one side negative unavoidable impacts are one of the reasons for social protests and contestations, with consequent delay in the construction phase, on the other side, every megaproject is technically a very complex challenge and suffers of the so-called "*uniqueness bias*", as defined by Flyvbjerg (2014, p. 9). The uniqueness bias is the curse of megaprojects, as each megaproject is different from all others, in terms of either technical features, the social and cultural identity of the area involved, or environmental aspects. Contestations, technical difficulties and the intrinsic complexity, thus, in the past pro-

voked constant and ever present delays, increase in costs and extremely prolonged public debates both in the academic (Corazza et al., 2023) and practitioner or policy-maker community (Debernardi et al., 2011). This needs holistic and systemic approaches to be managed (Shams Esfandabadi et al., 2023). Quoting Flyvbjerg (2017), every megaproject is affected by the "*iron law of megaproject*" (p. 11), i.e. the unavoidable delay in the realization, which ends in the "*over budget, over time, under benefits and over and over again*" law of megaprojects (around 90% of megaprojects end with delays and an increase in costs).

Hence, why do governments, policy- and decision-makers still invest billions of euros in megaprojects? The motivations lie in a purely individualistic and personalistic reason of primary stakeholders involved, rather than in the interests of secondary ones, i.e. as stated by Flyvbjerg (2014) the *four sublimes*. Despite the great and undoubted difficulties and negative effects, practitioners and policy-makers are still excited and attracted by creating and developing unique projects in terms of technical difficulties (technological sublime), aesthetical appearance (aesthetic sublime), social and political impacts (political sublime) or economic benefit (economic sublime). Indeed, engineers, designers/architects, policy-makers or managers are always attracted by one of such sublimes and achievements. The search for the sublime, drawing on the definition of Kant of "absolute great", i.e. "greatness that is equal only to itself", is not new and is a common unavoidable human desire, well-known and analyzed in philosophy and arts. Therefore, the concrete challenge related to megaprojects and infrastructure is not on how to avoid such human ambition, but rather on how to manage and shift such individual ambition toward a collective one, and to shift the construction industry from megaprojects to sustainable infrastructure, aiming at regenerating local ecosystems. In this sense, what is missing from the description of Flyvbjerg (2014) is a fifth sublime, the willingness to positively impact and regenerate the world (partly included in the political sublime), to integrate the artificial world with the natural one, according to a posthuman vision where humans are only part of a larger ecosystem (Braidotti, 2019), where the individualistic and anthropocentric sublimes are replaced by a set of "*ecosystem sublimes*", shifting from the individual sublimes toward new (still to be defined) collective (Williams, 2013) and democratic (Frank, 2021) sublimes.

1.2. Sustainable infrastructure or infrastructural territorialization

Infrastructure systems are responsible for 60% of the world's GHG emissions (OECD, 2019). Planning for sustainable infrastructure is therefore

essential to achieving sustainable development and meeting the Agenda 2030 objectives. According to Bhattacharya et al. (2019), infrastructure systems encompass both natural (such as land, forests, and oceans) and man-made (such as energy, water, and waste management systems, transportation, and telecommunications) systems. The Inter-American Development Bank (2018) states that sustainable infrastructure should not just be used as a synonym for green infrastructure (such as a renewable energy power plant) but are defined as "*infrastructure projects that are planned, designed, constructed, operated, and decommissioned in a manner to ensure economic and financial, social, environmental (including climate resilience), and institutional sustainability over the entire life cycle of the project*" (p. 11). Therefore, during the design, operating, and dismantling phases of a sustainable infrastructure, the project complexity – in terms of life duration, created impacts, and affected stakeholders – must be taken into account (OECD, 2019b).

A nation's wealth can be increased through sustainable infrastructure planning in a number of ways that are directly related to the SDGs, including by enhancing health and well-being (SDG 3), ensuring access to clean energy (SDG 7), promoting sustainable industrialization (SDG 9) and urban environments (SDG 11). In addition, by enhancing and enabling transportation networks and people's mobility, sustainable infrastructure may conserve marine (SDG 14) and terrestrial (SDG 15) environments as well as reducing inequality (SDG 10). The 17 SDGs are divided into three concentric circles: wellbeing, infrastructure, and natural environment. The infrastructure subset (SDGs 2, 6, 7, 8, 9, 11 and 12) serves as an enabler and a bridge to promote well-being (SDGs 1, 3, 4, 5, 10, 16) while maintaining the natural environment (SDGs 13, 14, 15). Waage et al. (2015) proposed this simple framework to better frame the relationships between the SDGs and sustainable infrastructure. The first-level objectives, then, are those people-centered and concerned with people's health, poverty, education, gender equality, and the advancement of an inclusive society. The second-level objectives (the infrastructure layer) are required to accomplish these aims. Therefore, sustainable infrastructure is essential to enhancing the production and distribution of products and commodities required to sustain people's well-being (first-level goals) in the areas of energy, clean water, food, transportation, and in general urban contexts, while avoiding negative impacts on the natural environment, which is reflected by the third-level goals linked to climate change, biodiversity preservation, and land and ocean conservation.

More specifically, although the aforementioned goals may be thought of as the core subset of infrastructure-related SDGs, infrastructure develop-

ment does not solely refer to them. Indeed, because they form the foundation of society, infrastructure systems have an impact on numerous objectives, both positively and negatively. 72% of targets are directly or indirectly influenced by infrastructure, according to Thacker et al.'s (2019) analysis. This finding highlights the need for policymakers to adopt long-term visions and planning strategies to achieve national sustainable development by avoiding silos and field-specific analyses and decisions. The strategy and the vision behind the decision to move forward with a large infrastructure are even more important than the management of the planning, construction, and operation phases of a megaproject, because megaprojects present the opportunity to reduce space and increase economic interchanges (e.g., transportation infrastructure), to increase local or national wealth (industrial facilities), as well as to benefit the environment (transport or energy infrastructure). By boosting the productivity of the current industrial sectors, megaprojects are the fundamental framework that enables lowering the cost of transportation and energy production. Therefore, the size of megaprojects has the potential to have a long-term impact on entire regions or entire countries, either positively or badly, by profoundly altering not just the immediate environment but also the social and economic circumstances of the local population (Flyvbjerg et al., 2003).

Megaprojects and the associated construction work take decades to be completed. Likewise with the accompanying effects they cause or can prevent. Failures or poorly designed infrastructure could, in this sense, force vast regions to pursue unsustainable development for years (OECD, 2019b). For instance, megaprojects and mega-infrastructure played a key role in colonial activities in developing nations throughout the previous century and were the cause of what is referred to as "*infrastructural territorialization*" (Lesutis, 2021). Territorialization of the infrastructure is the situation in which the development and creation of "territoriality" are a result of the infrastructure itself. For instance, in Kenya, the Uganda Railway had an unpredictable and unplanned influence on the region. In fact, a large concentration of Europeans was brought on by the Uganda Railway in the early part of the 20th century, which prompted the development of new urban centers along a 10-km stretch of land (Jedwab et al., 2017). Nairobi, which was merely a small area at the beginning of the 20th century, was selected as a construction station for the railroad, which led to its rapid growth (Lesutis, 2021). Similarly, large transportation infrastructure may influence indigenous communities, as the Mayan train megaproject in Mexico (Camargo & Vázquez-Maguirre, 2021) or entire cities and urban areas such as the Olympic games in Barcelona in Spain (Chappelet, 2014; C. Kennett & De Moragas, 2006) that shaped the city landscape and entire

neighbourhoods. Therefore, it is clear that the role of megaprojects is beyond the simple societal benefits generated by the provided services (e.g. energy produced, transport of people) – benefits that can be also provided, in a smaller scale, by generic infrastructure (not megaprojects) by reducing eventual negative impacts. Recalling the ideas of the four sublimes (Flyvbjerg, 2014), it is now clear the necessary shift from individualistic sublimes to collective ones, including long-term impacts and the "territorialisation" effect of megaprojects that goes far beyond mere accounting approaches or stakeholder engagement processes.

1.3. The need of a framework for sustainable infrastructure

Academic institutions and international organizations have worked together over the past years to develop general frameworks that might help to grasp all the ramifications that the building and maintenance of large infrastructure may have. For example, building on the well-known 3E framework of environment, economy, and equity, the UN Commission for Sustainable Development proposed four macro-areas in 2001 (United Nations, 2001) toward a framework for sustainability that includes indicators for people's health, education, and security as well as for the preservation of the land, the seas, and biodiversity. Other organizations, like the World Bank or the Group of Seven (G7), put more emphasis on the financial and governance components. In order to promote quality infrastructure investment, the G7 group, for instance, signed a self-commitment containing five principles: 1) ensuring effective governance; 2) ensuring job creation; 3) addressing social and environmental impacts; 4) ensuring alignment with economic and development strategies; and 5) enhancing effective resource mobilization (G7, 2016). With the help of these principles, the discussion of the governance model for sustainable infrastructure was highlighted, paying particular attention to the function of public-private partnerships in facilitating investments. Additionally, the Inter-American Development Bank (2018) suggested a novel framework with 14 aspects (including, for example, poverty, social impact, human and labour rights), more than 60 specific criteria, and was based on the four relevant dimensions – *economic, social, environmental, and institutional* – previously identified by other institutions. The governance at the local, national, and international levels (such as *Global and National Strategies*) as well as the importance of accounting and management systems for sustainable infrastructure are highlighted in the suggested framework. The institutional component encompasses elements like *global and national strategies*, *systemic change and gov-*

ernance, *management systems and accountability*, and *capacity building*; as a result, it also highlights the necessity of management systems and accountability for transparent governance.

In this sense, it is particularly noteworthy and innovative the fourth component, i.e. *institutional sustainability*. Indeed, institutional sustainability implies that, alongside the well-known and debated three E and the accounting and management of the social, environmental and economic impacts, it is crucial to adopt inclusive, transparent and open governance. Hence, according to institutional sustainability, new investments in sustainable infrastructure must be in line with the global agenda and the creation of national policies (United Nations, 2015). To support decision-makers during the planning, construction, and operation phases as well as to ensure transparency and boost confidence in the involved institutions, whether public or private, data collection and monitoring tools, assessment, and evaluation approaches are essential. The lack of information on contracts between the government and contractors, or between the main contractor and subcontractors, and more generally the lack of transparency in the management, tends to raise concerns in the civil society about potential bribery, fraud, and corruption since megaprojects and sustainable infrastructure are considered to be public goods (OECD, 2016). In that regard, the Organization for Economic Development (OECD) acknowledged that "*Infrastructure is primarily a governance challenge*" and listed ten major obstacles to manage infrastructure, ranging from the creation of a strategic vision (challenge 1) to the control of threats, to integrity (challenge 2) to the release and disclosure of useful data (challenge 8), to the resilience of the infrastructure (challenge 10). Bribery and corruption are particularly common (Flyvbjerg et al., 2003) in megaprojects and according to the Construction Sector Transparency Initiative, between 10% and 30% of infrastructure projects with public funding are lost to corruption. Four key industries – extraction and mining, building and construction, transportation, and ICT infrastructure – accounted for over 60% of these incidents (OECD, 2016).

The application of evidence-based instruments, including ex-ante and ex post impact assessments and reporting standard, should be mandatory to address this issue in order to prevent controversies and actively involve all key stakeholders throughout all phases of an infrastructure's lifecycle. Because of the "*uniqueness bias*" (Flyvbjerg, 2014, p. 9), there is no *one-size-fits-all* instrument for infrastructure auditing; instead, the right tools should be carefully chosen while taking into account the unique characteristics of the analyzed infrastructure and the impacted area. Decision-makers typically use cost-benefit analyses (CBAs) or environmental and so-

cial impact assessments (ESIAs), although the social component is frequently ignored (Khan, 2020; Mottee et al., 2020).

Concluding, it is not easy to choose the right tool. For example, categorization of tools and instruments may be done according to the project's lifecycle stage – 1. Prioritisation, 2. Planning/Preparation, 3. Procurement, 4. Detailed Design, 5. Finance, 6. Construction, and 7. Operation/Maintenance – and the corresponding infrastructure sector – general, transport, and energy (OECD, 2019b). Similarly, OECD (2018) divided the available norms and tools into three major groups in a different report: 1) Policy-related tools and instruments, 2) Project-related tools and instruments, and 3) Infrastructure-related data. Among others, Policy-related tools include a long list of instruments categorized in Framework, Financing, Governance, Development and Environment, while the Project-related tools are classified according to the different phases of a (Mega) project or infrastructure such as Planning and Prioritization, Institutional Capacity for Project Development, Project Preparation, and Transaction Support and Contract Management. Concluding, the Sustainable Infrastructure Tool Navigator (German Cooperation and UNEP, 2022), a web platform created by German Cooperation (implemented by the GIZ) in cooperation with the UNEP (United Nations Environment Programme) and the Sustainable Infrastructure Partnership (SIP), currently offers the most complete collection of tools, standards, and instruments (more than 50 instruments have been collected).

1.4. Toward a dialogic accounting approach

From this first chapter on sustainable infrastructure and the challenge of megaproject management, it is now clear that accounting and managerial studies should not simply focus on the management of the impacts or on the technical side of project management but on the institutional components of the most recent framework for sustainable infrastructure. Hence, a shift toward *Dialogic Accounting* (DA) practices, rather than *Monologic Accounting* is nowadays necessary. To recognize the role of stakeholders in organizations and to comprehend and decipher the mechanisms by which non-governmental organizations (NGOs), citizens, local communities, and the general civil society influence an organization's strategies and actions, dialogic accounting has become increasingly important in recent decades (Manetti et al., 2021). Stakeholders should be included in decision-making processes because they can lead an organization to shared solutions and shared values through their dialogic behaviours (Bellucci et al., 2019), if and only if the multidimensionality of interactions and conversations with and among stakeholders is acknowledged (O'Dwyer, 2005). DA has its ori-

gins in the groundbreaking research of the sociologist Habermas (1985), the political scientist Chantal Mouffe (1999, 2011), and the educator and philosopher Paulo Freire (1970). Habermas distinguishes between communicative and instrumental/strategic activities as two different categories of actions. The former seeks to achieve consensus and ensure that everyone participating in the discussion is aligned; the latter, however, is more concerned with achieving practical success.

In conclusion, dialogical accounting theory must be the foundation for sustainable infrastructure as well as megaproject planning and management because the impacts and consequences of infrastructure will affect a wide range of stakeholders, many of whom have conflicting interests. Furthermore, the disagreement between opposing visions and worries may be made worse by the high level of uncertainty in long-term future scenarios. Indeed, there may be a conflict between private and public interests. For instance, as businesses, contractors, and governments work to create infrastructure to benefit the entire population and community or their own economic interests, local residents and landowners fight to safeguard their properties and legal rights. Conflicts may also arise when combining short- and long-term goals. While politicians seek to create short-term job opportunities in order to achieve political consensus, environmentalists may want to protect and preserve natural ecosystems (although one of the most frequently advanced arguments is that benefits from infrastructure in the long-term may be notable and not negligible at local and global scales). In the next chapters of the book, dialogic accounting practices will be discussed in more detail by providing empirical evidence of the needs of a democratic and inclusive stakeholder management process and concrete examples and case studies.

1.5. Summary

This chapter introduces the main topics of megaprojects and sustainable infrastructure by framing the fundamental concepts necessary to face the complexity of megaprojects and large infrastructure. Starting from the *iron law*, the *uniqueness bias* and the *four sublimes*, concepts introduced by Flyvbjerg, the discussion then focused on the need of a framework for sustainable infrastructure. Specifically, according to the Inter-American Development Bank (2018) four relevant dimensions need to be considered for every sustainable infrastructure, namely, economic, social, environmental and institutional. From the social and institutional components, in particular, emerged the necessity to introduce a dialogic accounting approach, instead of a monologic one, to include all affected and involved stakeholders

and to develop a democratic and inclusive stakeholder management process during every phase of a megaproject, from the planning to the construction or the operation phase.

References

Adityanandana, M. & Gerber, J.-F. (2019). Post-growth in the Tropics? Contestations over Tri Hita Karana and a tourism megaproject in Bali. *Journal of Sustainable Tourism*, *27*(12), 1839–1856.

Bellucci, M., Simoni, L., Acuti, D. & Manetti, G. (2019). Stakeholder engagement and dialogic accounting: Empirical evidence in sustainability reporting. *Accounting, Auditing and Accountability Journal*, *32*(5), 1467–1499.

Bhattacharya, A., Contreras Casado, C., Jeong, M., Amin, A.-L., Watkins, G. & Zuniga, M.S. (2019). *Climate Change Division Attributes and Framework for Sustainable Infrastructure Consultation Report*. http://www.iadb.org.

Brahm, F. & Tarziján, J. (2015). Does complexity and prior interactions affect project procurement? Evidence from mining mega-projects. *International Journal of Project Management*, *33*(8), 1851–1862.

Braidotti, R. (2019). *Posthuman knowledge*. Polity Press.

Camargo, B.A. & Vázquez-Maguirre, M. (2021). Humanism, dignity and indigenous justice: the mayan train megaproject, Mexico. *Journal of Sustainable Tourism*, *29*(2–3), 371–390.

Chappelet, J.L. (2014). Managing the size of the Olympic Games. *Sport in Society*, *17*(5), 581–592.

Coblentz, L. (2019). Megaprojects: 1 ITER: Moving Towards Industrial-scale Fusion. *Resonance*, 1111–1123.

Corazza, L., Torchia, D. & Cottafava, D. (2023). Academics Applying Interventionist Research to Deal with Wicked and Complex Societal Problems. *Social and Environmental Accountability Journal*, (6), 1–18.

Debernardi, A., Grimaldi, R. & Beria, P. (2011). Cost-benefit analysis to assess modular investment: the case of the New Turin-Lyon Railway. *Contemporary Issues in CBA in the Transport Sector*, 1–15.

Esposito, G., Nelson, T., Ferlie, E. & Crutzen, N. (2021). The institutional shaping of global megaprojects: The case of the Lyon-Turin high-speed railway. *International Journal of Project Management*, *39*(6), 658–671.

Flyvbjerg, B. (2014). What you should know about megaprojects and why: An overview. *Project Management Journal*, *45*(2), 6–19.

Flyvbjerg, B. (2017). Introduction: The Iron Law of Megaproject Manage-

ment. In *The Oxford Handbook of Megaproject Management*. Oxford University Press, 1–18.

Flyvbjerg, B., Bruzelius, N. & Rothengatter, W. (2003). Megaprojects and Risk. In *Megaprojects and Risk*. Cambridge University Press.

Frank, J. (2021). *The Democratic Sublime: On Aesthetics and Popular Assembly.* Oxford University Press.

Freire, P. (1970). *Pedagogy of the oppressed.* The Continuum International Publishing Group Inc.

G7 (2016). *G7 Ise-Shima Principles for Promoting Quality Infrastructure Investment*. https://sustainable-infrastructure-tools.org/tools/g7-ise-shima-principles-for-promoting-quality-infrastructure-investment/.

German Cooperation and UNEP. (2022). *Sustainable Infrastructure Tool Navigator*. https://sustainable-infrastructure-tools.org/.

Habermas, J. (1985). *The theory of communicative action: Volume 1: Reason and the rationalization of society.* Beacon Press.

Inter-American Development Bank (2018). *What is Sustainable Infrastructure? A Framework to Guide Sustainability Across the Project Cycle*.

Jedwab, R., Kerby, E. & Moradi, A. (2017). History, Path Dependence and Development: Evidence from Colonial Railways, Settlers and Cities in Kenya. *The Economic Journal*, *127*, 1467–1494.

Kennett, C. & De Moragas, M. (2006). Barcelona 1992: evaluating the Olympic legacy. In *National identity and global sports events: Culture, politics, and spectacle in the Olympics and the football World Cup*. State University of New York Press, 177–195.

Khan, I. (2020). Critiquing social impact assessments: Ornamentation or reality in the Bangladeshi electricity infrastructure sector? *Energy Research and Social Science*, *60*(February), 101339.

Krige, J. (1994). Megaprojects, megateams and motivation. *Physics World*, *7*(5), 17–18.

Lesutis, G. (2021). Infrastructural territorialisations: Mega-infrastructures and the (re)making of Kenya. *Political Geography*, *90*(October), 102459.

Li, K., Zhu, C., Wu, L. & Huang, L. (2013). Problems caused by the Three Gorges Dam construction in the Yangtze River basin: A review. *Environmental Reviews*, *21*(3), 127–135.

Lu, H., Rohr, C., Hafner, M. & Knack, A. (2018). *China Belt and Road Initiative: Measuring the impact of improving transportation connectivity on trade in the region*. RAND Corporation.

Ma, H., Liu, Z., Zeng, S., Lin, H. & Tam, V.W.Y. (2020). Does megaproject social responsibility improve the sustainability of the construction industry? *Engineering, Construction and Architectural Management*, *27*(4), 975–996.

Manetti, G., Bellucci, M. & Oliva, S. (2021). Unpacking dialogic accounting: a systematic literature review and research agenda. *Accounting, Auditing & Accountability Journal*, *34*(9), 250–283.

Mottee, L.K., Arts, J., Vanclay, F., Miller, F. & Howitt, R. (2020). Metro infrastructure planning in Amsterdam: how are social issues managed in the absence of environmental and social impact assessment? *Impact Assessment and Project Appraisal*, *38*(4), 320–335.

Mouffe, C. (1999). Deliberative Democracy or Agonistic Pluralism? *Social Research*, *66*(3), 745–758.

Mouffe, C. (2011). On the political. In *On the Political,* Routledge, 1–154.

NCE (2016). *The sustainable infrastructure imperative: financing for better growth and development*. New Climate Economy. http://newclimateeconomy.report/2016/wp-content/uploads/sites/4/2014/08/NCE_2016Report.pdf.

O'Dwyer, B. (2005). Stakeholder democracy: challenges and contributions from social accounting. *Business Ethics: A European Review*, *14*(1), 28–41.

OECD (2016). *Getting Infrastructure Right: The Ten Key Governance Challenges and Policy Options*.

OECD (2018). *G20/OECD/WB Stocktake of Tools and Instruments Related to Infrastructure as an Asset Class-Background report*, (July).

OECD (2019a). *Sustainable Infrastructure for Low-Carbon Development in Central Asia and the Caucasus*.

OECD (2019b). *Sustainable Infrastructure for Low-Carbon Development in Central Asia and the Caucasus Hotspot Analysis and Needs Assessment*.

Qiu, J. (2007). Life on the roof of the world. *Nature*, *449*(27).

Randeree, K. (2014). Reputation and mega-project management: Lessons from host cities of the olympic games. *Change Management*, *13*(2), 1–7.

Shakirova, S. (2015). Country images of Kazakhstan: From stereotypes and critique to positive national branding. *Journal of Eastern European and Central Asian Research*, *2*(1).

Shams Esfandabadi, Z., Cottafava, D., Corazza, L. & Scagnelli, S.D. (2023). Sustainability Challenges of High-speed Railway Megaprojects from a Systems Thinking Lens. *Complexity and Sustainability in Megaprojects*, (June).

Sroka, R. (2021). Mega-projects and mega-events: evaluating Vancouver 2010 stadium and convention infrastructure. *Journal of Sport and Tourism*, *25*(3), 183–200.

Stone, R. (2008). Three Gorges Dam: Into the Unknown. *Science*, *321*(5889), 628–632.

Teo, M.M.M. & Loosemore, M. (2010). Community-based protest against construction projects: The social determinants of protest movement

continuity. *International Journal of Managing Projects in Business*, *3*(2), 216–235.

Thacker, S., Adshead, D., Morgan, G., Crosskey, S., Bajpai, A., Ceppi, P., Hall, J. & O'Regan, N. (2018). *Underpinning Sustainable Development*. UNOPS.

Thacker, S., Adshead, D., Fay, M., Hallegatte, S., Harvey, M., Meller, H., O'Regan, N., Rozenberg, J., Watkins, G. & Hall, J.W. (2019). Infrastructure for sustainable development. *Nature Sustainability*, *2*(4), 324–331.

United Nations (2001). *Indicators of Sustainable Development: Framework and Methodologies*. Background Paper No. 3.

United Nations (2015). *The Sustainable Development Agenda*. https://www.un.org/sustainabledevelopment/development-agenda/.

van Marrewijk, A., Ybema, S., Smits, K., Clegg, S. & Pitsis, T. (2016). Clash of the Titans: Temporal Organizing and Collaborative Dynamics in the Panama Canal Megaproject. *Organization Studies*, *37*(12), 1745–1769.

Waage, J., Yap, C., Bell, S., Levy, C., Mace, G., Pegram, T., Unterhalter, E., Dasandi, N., Hudson, D., Kock, R., Mayhew, S., Marx, C. & Poole, N. (2015). Governing the UN sustainable development goals: Interactions, infrastructures, and institutions. *The Lancet Global Health*, *3*(5), e251–e252.

Williams, H. (2013). The Oswald Review: An International Journal of Undergraduate Research and Criticism in the Discipline of English. *An International Journal of Undergraduate Research and Criticism in the Discipline of English*, *15*. https://scholarcommons.sc.edu/cgi/viewcontent.cgi?article=1136&context=tor.

Yang, S.L., Zhang, J. & Xu, X.J. (2007). Influence of the Three Gorges Dam on downstream delivery of sediment and its environmental implications, Yangtze River. *Geophysical Research Letters*, *34*(10), 1–5.