



## Urban Megaprojects as Disorderly and Unruly Endeavors

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### Abstract

Megaprojects have multiplied around the world as an urban response to the pressures of neoliberalism and globalization in favor of development, competitiveness and innovation. The protagonists of the megaprojects adopt a narrative of international competitiveness, framing a discourse dominated by the rhetoric of economic survival. The response has been urban transformations in which governments and private sector actors have struggled to position their cities and services within a global socio-political division of labor, production and consumption, and to coordinate their local networks with the requirements perceived or real aspects of an increasingly deregulated and neoliberal international economic system. It seems clear, then, that the phenomenon of megaprojects is intrinsically linked to the logic of growth, development, qualitative urban transformation, wealth creation, competitiveness and prosperity. One of the consequences of this overall framework is that megaprojects usually evolve from an orderly planning project to a disorderly and unruly endeavor. The complexities of construction, operation, management and governance of large projects entail a series of stochastic processes where risk and unpredictability become fundamental components of urban economic life.

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### Keywords

*Urban megaprojects; development; competitiveness; management; governance; sustainability; urban prosperity*

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### 1. Introduction

Over the last three decades, many of the large-scale urban interventions carried out by the public administration, in collaboration with private interests, have taken place outside the usual or traditional planning framework. Strategic planning, increasingly common in cities around the world, reflects the influence of globalization in achieving major changes in the institutional structure, processes, influence and scope of urban planning, as has been observed by Friedmann (2005).

Although both the state and developers try to clarify the design, planning and construction of megaprojects, civil society still perceives these great developments as full of secrecy, and this contributes to strengthening opposition initiatives and movements (del Cerro Santamaría, 2013).

"Introverted modes of governance that circumvent local planning frameworks, traditional democratic channels of participation, and any accountability are frequently observed" (Harris, 2017, 41).

Land use plans can play an important role in guiding real estate markets and ensuring "adequate allocation of public resources as a major contributor to the ability of cities to promote growth through urban megaprojects and equitably distribute their costs and benefits" (del Cerro Santamaría, 2013, 25).

Urban megaprojects are generally developed as public-private partnerships “with major impacts on the de facto privatization of planning; and they tend to be geared towards growth and competition rather than socially progressive ends. In general, there is a minimal commitment to public benefit or socially just policies arising from a primary focus on profitability” (Harris, 2017, 45).

From this point of view, urban megaprojects represent the paradigm of the entrepreneurial city and present most of the problems of this model of urban governance.

One of the most important issues in urban megaprojects is the financing mechanism, especially for the initial costs that correspond to the first phases of cleaning, decontamination of the soil, elimination of physical barriers and the creation of the necessary infrastructures. In addition, high investment costs, low expectations of returns, and considerable risks incurred during the early stages make private sector involvement unlikely. Despite the anti-statist and pro-market rhetoric of neoliberalism, the public powers facilitate (with notorious expenses) the private sector undertaking of their businesses, and without requiring a fair distribution of the benefits, a formula already known and burdensome for the public interests.

The public sector, therefore, has to frequently be in charge of regenerating and preparing land for the redevelopment required by urban megaprojects. And yet, given the limited financing capacity and tight public budgets of most municipalities and metropolitan regions, finding the resources necessary to carry out such large-scale operations is highly problematic and often unsuccessful.

In many other cases, funds are raised, the impact of these investments on local public budgets is typically high, and there is an obvious opportunity cost associated with them. Many urban megaprojects form the centerpiece of revitalization plans in their respective cities. Under the attractive perception of "connecting" cities and regions to the global economy, local politicians often over-promote the potential of the project.

The global rhetoric of urban planners and leaders and the image of renewal aimed at generating investment in cities and regions contrasts with the limited capacity of cities to attract and secure foreign capital investment. Many supposedly "global" megaprojects have only a local or regional scope, an indication of the many contradictions inherent in most urban regeneration plans based on re-qualifications and new land uses, as Fainstein (2001) has pointed out.

The multiple risks of megaprojects and the uncertainty associated with the possible financial viability of flagship projects severely limit the prospects for success in their construction and development and, at times, force developers to redesign initially ambitious projects.

The real impact of urban megaprojects has been magnified beyond reason. In many cases, megaprojects are not financially sound projects.

“They are driven by ostentation and use the economy as a mask to create completely unproductive businesses, built in urban areas that often cannot sustain them. Due to the large sums of money involved, rent-seeking behavior is common, as is the bias towards optimism in forecasting results” (Flyvbjerg et al., 2014, 63).

## **2. Disorderly and Unruly Megaprojects**

There is a tension between plans and vision in the development of megaprojects, the realization of iconic megaprojects and the political pressure exerted by the economic and financial interests that sustain the megaprojects. The positive or negative urban effects of large development plans depend significantly on the ability of strategic actors and participants to anticipate or at least adapt and successfully manage the ad hoc problems and collateral effects that are frequent in long implementation processes (del Cerro Santamaría, 2013, 32).

Local-global logic, or the tensions between site specificity versus global uniformity, are extremely influential in the design and construction of urban mega-projects.

“In this process, contextual elements such as history and local culture are important factors to interpret the architecture and to ascribe a specific meaning (local, regional, national, global) to the architectural practices used to build megaprojects and make them visible” (del Cerro Santamaría, 2013, 29).

Most megaprojects are physically and socially autonomous, isolated and disconnected from the context of the host city; therefore, they promote a similar urban form regardless of the host city, an urban form that encapsulates a very narrow definition of urban life and culture (Harris, 2017). The resemblance of most megaprojects to conventional global city images is suitable for some city marketing purposes, but clearly not all.

The paradox of the star architect is that he aims to create unique and unrepeatable places and yet we are witnessing “the multiplication of aesthetically striking cultural facilities and similar corporate headquarters all over the world with the effect of homogenizing cities. Ultimately, there is always the question of how to distinguish one megaproject from others and how to uniquely identify it with the particular city where it is built” (del Cerro Santamaría, 2013, 39).

## 2.1. Management

Projects are often led by inexperienced planners and managers who “continue to change throughout the long project cycles that apply to megaprojects, leaving leadership weak. Decision-making, planning and management are often multi-stakeholder processes involving multiple stakeholders, public and private, with conflicting interests” (Flyvbjerg, 2014, 76).

Furthermore, technology and designs are often non-standard, leading to an "exclusivity bias" among planners and managers, who tend to view their projects as unique, preventing learning from other projects.

“Often there is an overcommitment to a certain project concept at an early stage, resulting in a 'lock' or 'catch', making the analysis of alternatives unlikely and leading to *ad hoc* commitments at later stages” (Flyvbjerg, 2014, 54).

The achievement and delivery of the megaproject is a high-risk stochastic activity, with overexposure to so-called “black swans”, that is, extreme events with massively negative results.

“Managers tend to ignore this, treating projects as if they really exist in a deterministic Newtonian world of cause, effect, and control. Statistical evidence shows that such complexity and unplanned events are often overlooked, leaving budget and time contingencies not adequately addressed. As a consequence, misinformation about costs, schedules, benefits and risks is the norm throughout project development and decision making. The result is cost overruns, delays, and profit gaps that undermine project viability during construction and development” (Flyvbjerg, 2014, 67).

## 2.2. Economic Impact

In most megaprojects, global economic positioning and marketing towards a globally mobile elite prevails over concern for local issues (Harris, 2017).

“Members of the economic and political elites and their local affiliates can be particularly innovative in creating enclaves that protect them and their families from the worst effects of mega-projects and in spreading the culture-ideology of consumerism in which the new forms of global urbanity rest. Urban megaprojects and emblematic buildings, according to this point of view, are a powerful tool to transmit the consumerist values and practices that sustain capitalist globalization” (del Cerro Santamaría, 2013, 46).

There are examples of megaprojects where broad benefits have been achieved, combining international economic positioning with wealth distribution strategies.

“These cases show the existence of a Keynesian state model, with the aim of counteracting the cycles and damaging effects of the market, guaranteeing collective well-being and reducing inequalities. Two areas offer perhaps the most transferable opportunities: (1) housing, where increasingly significant portions of residential land are allocated to affordable housing; and (2) transportation, where the rezoned value of the land is used to finance public transportation infrastructure for other parts of the city, as well as for the project itself” (Harris, 2017, 71).

## 2.3. Context

Not all cities are well positioned to *be put on the map* by means of a megaproject, especially those of the second or third level in terms of population that are outside the main routes and flows of people and commerce, or lack a

metropolitan or regional government capable of financing itself. The expected success of the megaprojects reinforces the influence of the promoters, who will agree to negotiate only in places with obvious financial and location advantages.

Cities and regions around the world follow, in part, their own specific logic of development: “each has specific reasons that help explain the decline, and each may require localized strategies for redevelopment. Applying some of the ingredients of revitalization in most cities may be inevitable due to the rapid and uncritical adoption of political discourses from the center to the periphery, but hoping to repeat the success of a city in another context can be very difficult” (del Cerro Santamaría, 2013, 49).

However, these conditions are more likely to be found in larger cities that are already on the map. “In many places, mega-projects become spectacular global image campaigns due not only to possibly unrepeatable buildings, but also to local economic and political conditions. Far from being the triggers and drivers of revitalization, megaprojects sometimes follow urban revitalization processes” (del Cerro Santamaría, 2013, 54).

As a consequence of the important role played by local political conditions, “the successful replication of megaprojects elsewhere may require a careful analysis of existing preconditions and even a re-examination of the validity of the strategy when the political-economic climate changes. This need to pay attention to context when designing urban policies can represent a structural obstacle to the successful development of megaprojects in many cities” (del Cerro Santamaría, 2013, 38).

## **2.4. Resistance**

Dissidence, protest, and resistance against urban megaprojects do not occur frequently, “but can be successful when they do, with the effect of immobilizing the megaproject and defeating the plans of urban promoters and leaders, or at least forcing its modification. While the ambitions of urban elites contribute to presenting large projects as indispensable, global networks also help to explain why anti-megaproject movements can evolve from localized local protests over land abuse to large social movements with transnational ties” (del Cerro Santamaría, 2013, 61).

## **2.5. Evaluation**

The notion of “multiple success factors” and “success criteria” is not new in the field of project management and, in fact, is one of the most discussed topics by specialists.

“It is increasingly important to evaluate projects and their impacts at different times and based on multiple criteria in order to fully assess their performance. Success is often driven by political and / or power-related factors. Due to the strongly political nature of stakeholders throughout the supply chain and their different underlying goals, the success factors commonly considered no longer appear to be sufficient. This configuration requires innovative governance solutions that align the interests of different participants in a complex environment with a large number of key players” (Harris, 2017, 32).

## **2.6. Sustainability**

One of the main topics in relation to future research on megaprojects is the challenges of sustainability and “how megaprojects will cope with external industrial influences such as digitization and automation. Sustainability usually refers to environmental practices. In megaprojects, it is appropriate to use a broader definition, which includes concepts of economic, social and institutional sustainability” (del Cerro Santamaría, 2019, 9).

A megaproject can be defined as sustainable “if it is planned and executed to take into account the capacity, suitability, resilience, diversity and balance of its urban ecosystem. We consider sustainability as an organic process involving the environment, the economy and the community form and efficiency (environmental factors in design, architecture, engineering and construction) and the policies (plans and urban practices that explicitly aim to maintain and improve the economic well-being of citizens)” (del Cerro Santamaría, 2019, 12).

## 2.7. New Cities (New Towns) in South Korea

The reconfiguration of urban spaces through the construction of megaprojects is evident in the case of *new towns*, as is the case of South Korea. Although this type of construction is less frequent today in that country for various reasons, the case of two new successful cities on the outskirts of Seoul, Bundang and Ilsan, shows that, in South Korea, despite decentralization and Political and governmental neoliberalization, and the slowdown of its miraculous economic growth, the country still employs the concept of new cities in its megaprojects.

South Korea has been planning and building new cities for reasons not strictly residential. For example, to revitalize backward regions, South Korea has decided to create the cities of Saemangeum and Sejong, rather than revitalize existing regions. In order to better compete in the global economy, the Asian country has even chosen to build a new *global city* (Songdo) from scratch, instead of building iconic mega-projects within other existing cities.

South Korea's costly and risky endeavor to develop new populations to solve its problems is understandable when one considers its past experiences of success: Bundang and Ilsan, built on the outskirts of Seoul in 1989 to alleviate the housing shortage, are generally considered as the first symbols of the new urban developments in the country. In fact, Bundang and Ilsan were the first projects in South Korea to be formally dubbed "new cities" (*shin-doshi*), and their impact on subsequent construction has been significant. Its impact is not limited to South Korea. Many developing countries view Bundang and Ilsan as examples of new urban districts, or new cities, because of the surprising speed with which they were built and their ability to attract private capital to finance them.

More than a dozen countries have signed contracts with the developer of Bundang and Ilsan to import these new developments. The importance of Bundang and Ilsan and their possible influence on the construction of new cities, both domestic and international, should therefore be underlined in order to understand why these new cities have been considered a success. This also allows us to obtain some perspective to understand if these new projects can obtain similar results today in South Korea, and if they can work equally in other developing countries (Joo, 2013).

## 2.8. Kuala Lumpur: the Travels of Megaprojects

For more than two decades, research on urban megaprojects has focused on competitive efforts to *sell* venues. Megaprojects are not just large-scale sites; they also seek to be focuses of interest capable of creating a symbolic image visible on a global scale of cities and even nation-states. A significant number of researchers have studied the use of megaprojects as a way to produce a globally marketable image of the city. However, much less attention has been paid to evaluating the *success* of these imaging strategies, the channels that are used to circulate visual images, and the extent to which they are consumed.

This is the case in Kuala Lumpur (KL), Malaysia. High-profile megaprojects in KL since the 1990s have been the subject of analysis in various studies, but, to date, there has been no concerted effort to trace the global effects of such a re-imaging process through the *journey* of visual images of megaprojects. Based on KL megaprojects, such as the KLCC in the city center (which includes the Petronas Towers), we can consider a series of means through which tourist places circulate: films and television, *souvenirs*, planning models, references at the height of the building, commercial advertising and even academic practices.

The global repositioning of Kuala Lumpur has required considerable imaginative, discursive and symbolic investment. Some nation states in many regions of the world have applied *visualization* strategies to capture global audiences. In the Asia Pacific region in the 1990s, such strategies frequently materialized in urban mega-projects with a particular penchant for building skyscrapers.

The power of published images of a building, especially on television, is potentially greater than the visual experience of the building itself, since the latter is limited to a much smaller number of viewers. The KLCC project - and the Petronas Towers in particular - was destined to become a "cultural landmark" for Kuala Lumpur and Malaysia, placing the city and the nation on the "world map." Since it was announced by Prime Minister Mahathir Mohamad in 1991, it was clear that such an investment was being made to travel, to be on the map, and to be seen from afar (Bunnell, 2013).

## 2.9. Monstrous Hybrids in American Urbanism

Megaprojects are proliferating around the world, and they are also growing rapidly in the heart of every city in the United States in the form of stadiums, convention centers, and casinos. The economic arguments against these structures have proven fruitless, as megaprojects are driven vigorously by the local elite and growth coalitions and irreducible to criticism. In both Philadelphia, Pennsylvania, and Detroit, Michigan, historic buildings have recently been demolished, streets opened, and pedestrianized neighborhoods removed in the name of economic growth.

These projects, monstrous hybrids, can be understood as entities that represent a negative combination in the appropriation of commercial and governmental responsibilities. The proliferation and metastasis of megaprojects in the city center indicates a pathological increase in local government arrogance mixed with monopoly and opportunistic trade. Unless a reform of local economic policy is carried out, the negative impact of urbanism based on propagating megaprojects can be moderated by a more intelligent location of these structures, away from active urban areas, in large and accessible places from the center, but they do not visually dominate the neighborhood or its surroundings.

With respect to their downtown megaprojects, both cities represent two of the worst urban design scenarios, despite having numerous assets elsewhere. The Philadelphia Convention Center represents the worst case of "conglomerate" cities, in which a megaproject is inserted directly into the dense structure of the historic center, with active street life, abundant businesses, housing and organizations. The convention center is a bad case, but the situation in Detroit is far worse: It is one of the most extreme examples of the deterioration of the city center, which is being eaten up in its entirety by megaprojects, leaving a few fragments of its old structure like islands in an ocean of asphalt (Ryan, 2013).

## 2.10. Railway Megaprojects: Stuttgart 21

Since its introduction in the early 1990s, Stuttgart 21 was an extremely controversial project. Although without being uniform in their messages, purposes or methods, opposition groups and civic associations directly confronted the bold proposals of Stuttgart 21, demonstrating that cities are spaces in which growth-oriented neoliberal restructuring is most vividly expressed, but also where it is most fiercely confronted. Civic associations and the defense of the environment opposed the basic premises of the development plan from its inception. The *Umkehr Stuttgart* (Devuelvan Stuttgart) group was created to organize the opposition and to actively participate in the decision-making process.

Headed by the BUND, the largest environmental non-governmental organization, the alternative transport club VCD and a recently established citizens' group called *Leben in Stuttgart*, *Umkehr Stuttgart* organized a multifaceted campaign employing various forms of protest, including mobilizations in the streets, to support legal actions that promoted the development of alternative proposals. Opponents questioned every aspect of Stuttgart 21: from its alleged efficiency to its financing, to the alleged environmental sustainability of transport infrastructure and its impact on urban development.

There were general criticisms about the cost of the project. Even the German Federal Court of Auditors qualified the assessment of the real cost of the project as unacceptable. Critics also argued that the project's cost and risk were disproportionately subordinated to the public sector, as Deutsche Bank, the main private funder, significantly reduced its financial exposure over the years. Public investment in the project affected investments in local and regional transportation elsewhere, posing a threat to existing services. In addition, the transportation priorities of the project and the announced improvements to the Stuttgart rail crossing were questioned (Novy & Peters, 2013).

## 2.11. The Afghan Ring Road Megaproject

The great bypass highway under construction in Afghanistan connects almost all major cities in the country (Kabul, Lashkar Gah, Herat, Mazar-e- Sharif). The question is to identify the actors and institutions responsible for the construction of the ring road and to determine the reasons for carrying out a massive construction project (a 5,000-kilometer highway) in a place of conflict. The main participants in the project, civilian government agencies, the military, promoters and banks, have specific reasons for participating in a megaproject of such magnitude.

The main reasons for the territorial restructuring that the road produces are the desire to satisfy the world's energy needs using the energy supplies of Central Asia (capitalist globalization at its best geostrategic expression), and the military need to efficiently transport goods through the limited regional systems available in South and Central Asia. It is, therefore, a geostrategic project. The bypass was conceived as a ring, a unique shape that could serve to maintain US / NATO control within the borders of Afghanistan and which could ultimately pass into the hands of the Afghan state.

However, the construction of this mega-project, and the safety strategies that the road has enabled, suggest that “it embodies a form of “global conflict” that encourages close connections between local powers and transnational powers while ignoring the state. Afghan completely. What implications does this dual strategy of building and dismantling the Afghan nation have for international development? The strategy constitutes a “mega-megaproject”, a reform package that is based on the physical transformation of the Afghan infrastructure to win the trust of the population. The Afghan Highway allows one to examine the ways in which even pre-existing structures within a nation have been modified to fit a mega-project-based strategy” (Miller, 2013, 45).

The scalar implications of this megaproject can be seen by focusing on the political and social aspects that have shaped the use of this highway. The first scalar implication is local, although supported by global forces: the *conflict economy* of tolls for local militias. The second scalar implication is global, but sustained by local forces: the physical manifestation of regional geopolitical interests in energy resources through the financing and construction of roads. The Afghan state has not played a significant role in any of these power structures, suggesting that the scale of the 'nation' is irrelevant to many of the economic and physical processes that occur on the Afghan border (Miller, 2013).

## **2.12. Controversy and Defeat: the Mexico City Airport**

Can megaprojects completely fail despite the backing of the government and pro-growth coalitions? This seemed to occur in Mexico City, where some of the political and economic conditions that can lead to the failure of an urban megaproject have arisen. The case of the frustrated attempt to build a new international airport in the metropolitan area of Mexico City shows the nature of the social and political alliances that were created to stop the airport project and the great socio-spatial, political, economic and economic conditions. institutional institutions under which these alliances were forged.

Several relevant factors led to the failure of this megaproject: “the divisions within and between the political classes, and of these with the citizens, driven by democratization, decentralization and globalization; the enabling and participatory power of the local State vis-à-vis the national one that sustained the citizen opposition; and the importance of cultural identity, historical alliances, and geographic location in mobilizing a wide range of local, national, and international alliances to fight the project” (Davis & Flores, 2013, 56).

The case of the failed Mexican airport suggests “that the historical and institutional legacies of national and urban development in Latin America have created bureaucratic ambiguities and tensions over who is ultimately responsible for the development of large infrastructure projects in countries in the process of democratic transition” (Davis & Flores, 2013, 65).

This same urban, political and institutional history has also deprived planning authorities and private developers of previous experiences regarding the role of citizen participation in the development of an urban megaproject.

With these legacies, countries like Mexico “have not yet developed institutional structures and processes that improve legitimacy and allow success in the construction of megaprojects subject to strong citizen opposition. In this sense, the failure in the construction of the airport megaproject in Mexico City reflects a moment of precariousness in the political and economic development of the country, as well as the strength of the opposition that developed around the project” (Davis & Flores, 2013, 68).

### **3. Infrastructure and Environmental Challenges in China**

Infrastructure and megaprojects have opened the door to socio-economic development in China. While the socioeconomic results are indisputable, China's performance in the area of environmentally sustainable development leaves room for improvement. According to the PRC Ministry of Ecology and Environment (PRCMEE), "two-thirds of China's lakes have chemical deficiencies caused by pollution. As a result of pollution and increasing consumption, two-thirds of China's cities are short of potable water. Air is heavily polluted across the northern heavy industry belt from Shanxi to Liaoning provinces and along the heavily industrialized east coast. Many polluted industrial sites will require extensive soil remediation before they will again be fit for human use" (PRCMEE, 2016, 13).

According to a New York Times report, China is responsible for 47% of the world's coal burning, which is more than all other countries in the world combined. As a result, "respiratory diseases that are directly related to air pollution are currently the leading cause of death in China, according to the World Wildlife Fund (WWF). In addition to some of the world's worst air pollution, China also has many waterways that are highly polluted. According to the Economist, more than 50% of China's surface water is not fit for human consumption, whereas approximately 60% of the groundwater under Chinese cities is considered to be severely polluted" (Watkins et al, 2018, B3).

#### **3.1. Energy**

According to the World Bank, "Electricity production in China doubles nearly every 10 years. China now generates 18 percent of all electricity globally, only slightly less power than the United States. China's non-fossil fuel electrical power sources are still overwhelmingly nuclear and hydro (96 percent combined), according to the World Bank. The more difficult target to achieve will be 20 percent renewable power production by 2020. Despite rapid growth, wind and solar energy sources still make up less than one percentage point of total electricity production in China. Since solar power is still more expensive to produce than electricity from coal-fired turbines, the government offers subsidies either for capital investment or operations, but neither subsidy is sufficient to break-even under current conditions" (World Bank, 2018, 25).

In addition to renewable power generation, there is a growing market for energy service company (ESCO) projects, "which can help to reduce energy consumption and greenhouse gas emissions. ESCO projects typically finance the purchase of new energy-efficient equipment through projected savings on future fuel bills in comparison with old or energy-hungry machinery. While the World Bank and many smaller "green funds" have already entered this market, many local investors are hesitant, since they find the five-to-10 year payback period too long. This is one factor contributing to opportunities for foreign energy savings companies with local partners" (Bachman & Burnett, 2012, 35).

#### **3.2. Water and Wastewater**

Future efforts to increase water sector performance should adopt a more integrated approach. "The different components of urban water systems—water, wastewater, and stormwater—are often handled by different government organizations with different, sometimes competing agendas. Integrated water resource management can be used to match water quality to water uses, improve treatment cost-effectiveness, and raise the quality of discharged water to environmentally safe levels. China's water industry will open up for reverse osmosis, membranes, and other advanced treatment technologies that minimize energy inputs and simplify operations" (Southerland, 2017, 43).

#### **3.3. Transportation**

Transit-oriented development (TOD) is key in the development of Chinese cities. To be sure, land use and density factors are not yet considered systematically during design. However, "many cities retrofit their zoning codes after subway construction to allow development to cluster around transit stops. With the right land use mix, this offers the possibility of higher use of non-motorized transport. At least 13 Chinese cities currently have one or more subway lines under operation, 54 lines covering 1,700 km. Another 76 lines, or an additional 1,600 km, are under construction. The target is 40 subway systems by 2020 covering about 7,000 km. At this pace and scale, TOD is poised to make a big difference in the long-term sustainability of urban living" (Luo et al, 2017, 41).

### 3.4. Desertification

According to Smith, “China is also dealing with rampant soil erosion and desertification, which is a type of land degradation that is a result of previously fertile soil transforming into arid land due to poor agricultural practices and land management, as well as extreme climate change. Both desertification and soil erosion cause blinding dust storms and river-clogging mud that have battered Chinese cities located near the edge of the Gobi Desert. According to the WWF, desertification has already swept over 30% of China’s land mass. Since 1978, the Chinese has followed guidelines set by the Three-North Shelter Forest Program, otherwise known as the Great Green Wall, which involved the construction of what is now over 66 billion trees that are used to block the path of the Gobi’s storms. Despite this afforestation project, the desert’s expansion continues to affect various surrounding cities” (Smith, 2018, 32).

And Schwärzel argues that, “As towns continue to get swept under sand as a result of these storms, the Chinese government is forced to move affected populations away from degraded lands. In fact, between 2003 and 2008, over 650,000 people who were previously living in China’s Inner Mongolia province were forced to resettle in other cities. An even more concerning fact is that these sand dunes are forming only about 44 miles away from Beijing at a pace of almost 2 miles each year. To prevent the capital city from being submerged in sand, the Chinese government must investigate new and creative ways in which natural ecosystems can be restored” (Schwärzel, 2017, 21).

### 3.5. Sustainability Challenges in China

One of the factors contributing to the complex essentially complex nature of sustainability is that, in conceiving and presenting the goals of preserving sustainable strategies, sustainability appears as interdependent on the dimensions of entrepreneurship, innovation and competitiveness of economies. Indeed, the goal that is presented to us in the majority view on sustainability is “green capitalism,” that is, not a sustainable global society with clearly established limits to growth, but rather the sustainability of the information and knowledge economy, to which reformers and planners add more or less ambitious commitments to the environment (Meadows, Randers et al, 2004). The Chinese case illustrates the possibilities, contradictions and limitations of this approach (World Bank, 2018).

In early 2019, the Chinese government approved three sustainable development zones, Shenzhen, Guilin and Taiyuan , which form the leading axis in Chinese innovation (Ness, 2018). These zones are implementing the 2030 United Nations Sustainable Development Goals.

“Shenzhen is China’s innovation engine. This zone will integrate technologies in sewage treatment, waste utilization, ecological restoration, and artificial intelligence to solve issues from resource management to pollution. Guilin will focus on innovations that tackle desertification, creating solutions that can be replicated by other regions facing the threat of encroaching deserts. Taiyuan, targeting air and water pollution, will foster innovative solutions that can be replicated by regions relying on resource extraction” (XinhuaNet, 2018, 22).

Shenzhen, Guilin and Taiyuan function as large sustainable innovation districts (or innodistricts). In these newly developed urban areas, achieving sustainability usually means achieving environmental sustainability. This goal by itself, however, does not guarantee the sustainability of innodistrict development in the knowledge economy (Carnes, 2016). This objective must be pursued in a comprehensive and holistic way (United Nations SDG 2030), such that it is integrated in innodistricts, any infrastructure projects, industrial corridors for advanced manufacturing, factories of the future and other development projects. It ought to take into account:

- (1) environmental sustainability, promoted by sustainable infrastructure and the creation of "sustainable development zones";
- (2) sustainability in the design and planning of the development project ;
- (3) sustainability in management;
- (4) institutional sustainability, aimed at the integration of all relevant stakeholders, and
- (5) socioeconomic sustainability, based on a strategic alignment of the project's objectives with urban, regional and even national policies.

Complex sustainability, therefore, is an organic process that includes the environment, the economy and the community; “form and efficiency (environmental factors in design, architecture, engineering and construction) and policies (plans and urban practices that aim explicitly to maintain and improve the social and economic well-being of citizens). Thus a development project can be defined as sustainable if it is planned and implemented to take into account the capacity, adaptability, resilience, diversity and balance of the ecosystem where it is located and of which it constitutes a symbiotic element” (del Cerro Santamaría, 2019).

Despite this systematic and holistic approach, the limitations of many of the sustainability strategies underway today persist. Such limitations are seen in the fact that, to the extent that countries shift into the transition from urban property investment and finances to science, knowledge and innodistricts, what we see is that sustainability strategies, including environmental sustainability, are conceived as a central element in the positioning of the market.

“As cities and countries climb the industrial value ladder and expand their service sector to cater to growing domestic demand, environmental quality will become central to achieving sustainable economic growth. Urban residents in the more sophisticated markets are already putting a substantial price premium on high-quality urban environment (i.e., ecological or "sustainable"). To attract the right labor pool, cities will need to raise their game further” (World Bank, 2018, 33).

Thus, in global cities like New York, London or Sydney, among others, certain strategies aimed at sustainability can have the perverse effect of gentrification (Curran, 2017), which starkly reveals the problems of anthropocentric sustainability. From this perspective, the planet continues to be considered exclusively a resource for human use.

#### **4. Towards Urban Prosperity**

Any fairly rigorous analysis of the impact of urban megaprojects on the economic growth of cities yields a result that generates skepticism: megaprojects act as supposed catalysts, but do not directly achieve important economic transformations in the cities where they are built. If spectacular architecture and urban mega-projects are not enough to positively transform a struggling urban economy, how can cities and regions successfully implement policies that, in times of globalization, bring economic benefits to citizens?

The answer lies at the intersection of political economy, the historical and socio-economic context, and the reconsideration of urban boundaries as an integral part of broader regional networks of production and trade. Although globalization offers new dimensions linked to the development of megaprojects and emblematic projects, it is also revealed - firstly - in the formation of networks, flows and economic nodes that link cities with the world economy. Therefore, any fundamental analysis of contemporary urban development must focus on the economic globalization of cities and regions, the patterns of transnational finance and foreign trade. And thus, aligning the goals of megaprojects with regional and national policies has often proven to be a good decision.

In many cases, the pillars of the recent evolution of cities to embrace the requirements of globalization were already present in the golden years of urban transformation: industrialization based on exports and the transnational reach of the local and regional financial bourgeoisies. This recent era of globalization, therefore, is not a new phenomenon in many cities (except, perhaps, for its scale, scope, and complexity), but rather a new cycle in a secular trend for cities to join global economic circuits. Thus, despite the exacerbated pace of recent financial globalization and its spectacular technological infrastructure, its mechanisms and trajectories are not new.

As Giovanni Arrighi, the late Italian economist, argues, “much of what is known as “globalization” has in fact been a recurring trend of world capitalism since modern times. This recurrence makes the dynamics and likely outcomes of current transformations more predictable than they would be if globalization were as novel a phenomenon as many observers think” (Arrighi, 1997, 26).

Without a doubt, the most spectacular expansion of the last two decades, and the strongest evidence used by the arsenal of defenders of the globalization thesis as a recent novelty, has not been in FDI or world trade, but in financial markets worldwide. Since 1980 the total value of financial assets has grown two and a half times faster than the aggregate GDP of all advanced industrial economies.

“And the volume of transactions in currencies, bonds and stocks has increased five times faster. In the absence of this explosive growth in world financial markets, we would probably not be talking about globalization today, and certainly not as a departure from the ongoing process of world market reconstruction launched under the hegemony of the United States after World War II. The idea of globalization was identified from the beginning with the idea of intense interstate competition for increasingly volatile capital and a consequent subordination of most states to the dictates of transnational corporations. Urban megaprojects emerged as a prominent vehicle for providing cities with an edge in the growing competition for capital and investment” (Arrighi, 1997, 31).

This vision of financial globalization and the restructuring of States caused by global processes has had consequences for the planning of policies associated with the construction of urban mega-projects that want to be successful. A first consequence has been the transformation of urban planning frameworks, processes and tools. The agencies and administrative procedures that implement planning policies have been integrated within the variable organizational structures of the States. However, in a flexible and post-Fordist or 'disorganized' economic framework, there is a clear trend towards endowing megaprojects with their own strategic spatial plans, as mentioned above, which no longer depend on state regulations but not even of the urban regulations in operation.

Such organizational structures determine the levels of the political-administrative machinery to which planning powers are attributed and the political dynamics through which these powers are exercised. Administrative scales are further relativized with new policies and regulations promulgated at different levels, and we have been witnessing a reordering (or reterritorialization) of the State in an explicit hierarchy of jurisdictions. Despite everything, new forms of relationships between administrative levels continue to emerge, which are necessary to implement strategic planning policies, since disaggregating the objectives of megaprojects from regional or national goals is not desirable or convenient with a view to achieving results.

Therefore, megaprojects, supposed catalysts of urban development, “can also be used at the national level as tools to advance urban and regional policy. In countries with active national urban policies towards urban development, megaprojects are often planned at the national level to address housing problems, redirect urban development to specific areas, or trigger economic development in specific sectors. In such cases, projects are integrated with broader economic and social policies and tend to reflect broader economic trends as well” (del Cerro Santamaría, 2019, 8).

The role that urban megaprojects can assume as instruments of national policy also depends directly on economic cycles and political programs. Megaprojects can become an instrumental way of increasing public spending in periods of private sector withdrawal, as a way to maintain or boost aggregate demand. Public spending through urban megaprojects can create conditions for productive investments and have an important multiplier effect in terms of social return on investment and increase in GDP.

Finally, “when studying megaprojects in connection with urban growth coalitions, we can ask ourselves whether the form of development represented by these large projects simply legitimizes *growth machines* and commercial interests, or whether this phenomenon can be analyzed from the prism of the role played by state actors and agencies in urban restructuring” (del Cerro Santamaría, 2019, 7).

The study of megaprojects shows that they can function as pro-growth strategies, but are usually less decisive as direct development mechanisms with a synergy of their own than as symbols or catalysts for such development and the possible economic improvement that it entails.

The study of urban megaprojects, emblems of global capitalism, helps us understand the dynamics of the economic system and urban development at different geographical scales. Urban megaprojects have multiplied in the last two decades throughout the world and their transnational deployment continues to be one of the most important phenomena for understanding a variety of socio-economic processes of global reach in this 21st century. We remain convinced of the advantages of a multidisciplinary approach to understanding the complexities of urban megaprojects and the contradictions inherent in globalization and contemporary urban development.

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