

Is Beijing Gobi?

The Gobi Desert As A Site of Extended Urbanization

Introduction

Within urban studies, the city is usually conceived of as a bounded, discrete site of analysis. Over the past several decades, a critique has emerged of this interpretive paradigm, arguing that the city can only properly be understood in relation to its hinterland, the “constitutive outside” on which it depends for labour and resources. Such arguments typically envision power relations between the city and non-city as *centrifugal* — while the operational landscape upon which the urban settlement depends may extend ever further, such seemingly centripetal spatial development only serves to power the growth of the agglomeration at different scales.

I would like to problematize this notion of the relationship between the city and the hinterland as being a centrifugal, one-directional, extractive flow of resources from the “rural” to the “urban.” The environmental impacts of economic growth — anthropogenically-induced processes such as climate change, sea level rise, air pollution and desertification — have begun to significantly affect pre-existing systems of capital accumulation throughout the global network, reflecting and redirecting the externalities of urban growth back onto the city itself. An increasingly complex dialectic has thus developed between economy and ecology, with one transforming the other and back again in a fragmented and multi-scalar feedback loop. In the urban theory lab, we have been refining our understanding of these relationships, suggesting that there is actually a far more complex and mutually impacting relationship between city and non-city: what we have termed concentrated and extended modes of urbanization.

Investigating the connection between Beijing — an almost paradigmatically urban mega-city of 21 million people — and the Gobi desert — an inhospitable desert-steppe that is considered among the world’s most remote regions — offers a fascinating case study of the

increasingly blurred and mutually impacting relations between the city and the non-city. Beijing functions as the primary infrastructural and administrative node within the regional network of northern China. The Gobi desert, located less than 300 kilometers from the Beijing metropolitan region and straddling the Chinese-Mongolian border, is the site of massive mineral deposits upon which the Chinese economy is increasingly dependent. Many of the raw materials extracted from the Gobi are either directly consumed by or pass through the city of Beijing on their way to broader national or global markets (it is said that 7 out of 10 lightbulbs in Beijing are fueled by coal from the Gobi).¹ Indeed, the primate role of Beijing within China's industrial development, particularly in the period from 1949-1978, means that the extant infrastructural networks in the region are highly centralized around the city. The political, economic and infrastructural connections between the city and this hinterland space are critical, both for the continued growth of the capital city and the coal-powered economy of China more broadly. Indeed, the largest driver of development within the Gobi region has been precisely these extractive industries, with nodes and networks positioned to efficiently integrate the region into the Chinese — and now, increasingly, Mongolian — economies.

Indeed, as I hope to outline in some detail in this paper, patterns of development in the Gobi are inextricably linked to the conditions of possibility of surrounding cities, particularly Beijing. We can formulate a research agenda through asking two related questions, rhetorical as much as literal: 1) Is Beijing Gobi? 2) Is Gobi Beijing? In other words, how have relations between the city and the non-city been (re)configured, particularly under a neoliberal paradigm?

In order to answer these questions, this paper examines two processes that have had significant impact on the nature of developments in the Gobi region: 1) The development of extractive industries and associated infrastructures. 2) Anthropogenically-induced forms of land degradation and associated strategies of land reclamation. As these processes are investigated, particular attention will be paid to illuminating the new and changing connections between concentrated and extended modes of urbanization in this region.

¹ Zhang Xueying, "Changes in the Inner Mongolian Grasslands," *China Today* (Sep 2007): 12.

Case Study 1: Development of Extractive Industry in the Gobi Region

The history of development in the Gobi has not been a smooth transition from barren wilderness to high-tech extraction site. Rather, the scale and intensity of land use activities have expanded and contracted in tandem with changes in Mongolian and Chinese political economies. In China, these shifts occurred most dramatically following the watershed years of 1949 and 1978. The period of rapid industrialization following the 1949 revolution led to major transformations in the Chinese Gobi region, which became a key site of industrial development and resource extraction. Such policies were outlined in the PRC's first Five Year Plan, from 1953-7, which called for the development and integration of mines in the Inner Mongolia region into the national rail infrastructure.² The city of Baotou, on the southern edge of the Gobi, became one of the biggest industrial zones in China, due to the presence of limestone, coal and iron ore deposits nearby in Bayan Obo. Other industrial zones were also developed in the Gobi during this period, such as the steel factory at Jiayuguan, established in 1958.³

The pro-peasant, anti-urban ideology of the Maoist period redirected growth away from the coastal cities towards remote parts of the country like Inner Mongolia. During the 1950s and 1960s, strict controls were imposed on internal migration in order to prevent urbanization. Indeed, population flows often occurred in the opposite direction, as hundreds of thousands of urban residents were sent into the countryside, either for purposes of political rehabilitation or to prevent over-population in cities.⁴ A policy of "rural industrialization" was also encouraged, dispersing development in order to create a more balanced economic geography.⁵ In the case of Inner Mongolia, such developments also served as barrier zones against Soviet expansion. The barren nature of the Gobi was instrumentalized as a buffer against the Soviets, particularly following the Sino-Soviet split of the late 1950s.⁶

² Claude Comtois, "Transport and Territorial Development in China 1949-1985," *Modern Asian Studies*, 24:4 (Oct., 1990): 785.

³ "Baotou," *Encyclopedia Britannica Online*, accessed Mar 14, 2013 at: <http://www.britannica.com/EBchecked/topic/441699/Baotou>

⁴ Rose Maria Li, "Migration to China's Northern Frontier, 1953-82," *Population and Development Review*, 15:3 (Sep., 1989): 503.

⁵ Zai Liang, Yiu Por Chen and Yanmin Gu, "Rural Industrialisation and Internal Migration in China," *Urban Studies*, 39:12 (2002): 2175.

⁶ Li, 503.

China's transition towards market policies, initiated by Deng Xiaoping in 1978, has had major implications for developments in the Gobi, transforming the region from a comparatively isolated space into one that is increasingly enmeshed in global political economy. As a result of decentralization and marketization post-1978, there has been a significant increase in mining activities in order to fuel urbanization in the rest of China. Semi-private mining companies have begun to compete with state-owned companies, leading to a "coal rush" that has turned Inner Mongolia into the largest coal-producing region in the country.⁷

This has been accompanied by a massive expansion of infrastructure — both road and rail — in order to transport coal to Beijing and to ports on the northeast coast, where it can be shipped to other parts of China. Two rail lines running through the Chinese Gobi are devoted exclusively to coal — the Datong-Qinhuangdao and the Baotou-Shenmu-Huanghua lines — though as will be outlined below, there is still a shortage of infrastructure capacity in the region. Coal now accounts for almost half of the total volume of goods transported by the Chinese rail system overall.⁸

The expansion of expressways has also been a major focus of the Chinese government in the post-reform era. 70,000 miles of expressways have been built between 1988, when the program was begun, and today; these include the 312, G6 and G7 routes that run from Beijing through the Chinese Gobi, skirting the Mongolian-Chinese border on the way towards the Tibetan plateau. The construction of infrastructure has been at such a vast scale that it has almost become an ideological mission, a kind of "civilizing project" to bring economic development to the hinterlands. Propaganda billboards in the countryside often proclaim: "Want to get rich? Build a road first!"⁹

The establishment of Mongolian independence, following the collapse of the Soviet Union in 1991, has had a major impact on the development of extractive industry in the Gobi. Even though the Soviets were aware of the considerable mineral wealth in the deserts of southern Mongolia, the remoteness of the region meant that little development occurred during the socialist period (with the exception of the construction of the Trans-Mongolian railway in 1954-6). Cut off from Soviet financial assistance as well as the captive export markets provided by

⁷ Tim Wright, *The political economy of the Chinese coal industry: black gold and blood-stained coal* (London: Routledge, 2012), 28.

⁸ Wright, 31.

⁹ Morten Axel Pedersen and Mikkel Bunkenborg, "Roads that Separate: Sino-Mongolian Relations in the Inner Asian Desert," *Mobilities*, 7:4 (Nov 2012): 555-556.

COMECON, the Mongolian economy imploded in the early 1990s. Following the advice of neoliberal institutions such as the World Bank, the IMF and the Asian Development Bank, the government adopted a “shock therapy” approach to rapidly and radically transform the planned economy into market economy.¹⁰ The typical neoliberal template was adopted: prices were liberalized, state subsidies and expenditures were cut, agro-pastoral collectives were dismantled and state industries were closed and/or privatized; the result was massive socio-economic turmoil and a notable increase in pastoral populations as unemployed workers migrated out of the cities in search of livelihoods.¹¹

In response to these crises, the Mongolian government proceeded to institute a firm neoliberal state apparatus over the next few years, “[facilitating] conditions for profitable capital accumulation for all comers.”¹² In 1994, the Law on Land granted the *de facto* emergence of private property, allowing Mongolian and foreign individuals the right to lease state-owned land and use it for their private purposes. In 1997, the framework for foreign direct investment was further strengthened as Mongolia joined the World Trade Organization and passed the Minerals Law to facilitate mineral surveying and extraction, modeled on similar legislation in Western countries. It was praised by the international mining community as “one of the strongest legal presentations of mineral licensee rights and obligations in the world, and clearly the most investor-friendly and enabling law in Asia.”¹³

In varying degrees of financial partnership with the Mongolian government, foreign mining companies have begun to develop a number of large-scale mining facilities in the Gobi. The two most important are Oyu Tolgoi, a copper-gold mine being developed with assistance from the Canadian exploration-development company Turquoise Hills and the British-Australian corporation Rio Tinto and Tavan Tolgoi, the world’s largest coal mine, being developed under the tutelage of the state-owned mining company Erdenes and several foreign partners (German and Australian). While there have been attempts by the Mongolian government to strengthen the national stake in such ventures — including the introduction of a short-lived wind-fall tax in

¹⁰ Julian Dierkes, “Introduction: Research on Contemporary Mongolia,” *Change in Democratic Mongolia*, ed. Julian Dierkes (Leiden: Brill, 2012): 7.

¹¹ David Sneath, “The Rural and the Urban in Pastoral Mongolia,” *Mongols from Country to City*, ed. Ole Bruun and Li Narangoa (Copenhagen: Nordic Institute of Asian Studies, 2006): 149.

¹² David Harvey, “Neo-liberalism as creative destruction,” *Geogr. Ann.*, 88 B:2 (2006): 147.

¹³ Mette M. High, “The Cultural Logics of Illegality: Living Outside the Law in the Mongolian Gold Mines,” *Change in Democratic Mongolia*, ed. Ole Bruun and Li Narangoa (Copenhagen: Nordic Institute of Asian Studies, 2006): 257.

2007, stipulations of foreigner-Mongolian worker ratios and endless renegotiations of the finances of specific leasing agreements — the overall trend has certainly been towards the state acting as a “manager” or “co-ordinator” to facilitate the entry of transnational corporations onto Mongolian soil.¹⁴ The weakness of the legislative framework to protect pastoral communities from displacement by these mining companies, as well as a violent crackdown on local artisanal and small-scale mining operations throughout the country further demonstrates the tenacity of these neoliberal trends. In 2011, Mongolia was the world’s fastest growing economy, almost entirely due to the development of the mining industry.

Despite the heavy involvement of transnational capital in these operations, the physical proximity and resource needs of China have drawn these new mining regions almost exclusively into the Chinese orbit — in 2011, 90% of Mongolian mineral exports went to China.¹⁵ The most significant influx of foreign labour into Mongolia has also come from China, due to a shortage of skilled labour in Mongolia. Due to long-standing ethnic tensions, Mongolian and Chinese workers are usually housed separately, with Chinese being housed in repurposed shipping containers and Mongolians in traditional yurt tents. The morphology of such settlements thus directly reflects the geopolitical tensions at play in the region. Indeed, transnational mining settlements such as Oyu Tolgoi operate on a “separate plane” from the surrounding communities within which they are embedded.¹⁶ The integration of the mine into global networks of labour and capital removes it from its immediate surroundings and incorporates it into a more extended urban fabric.¹⁷

However, the development of this extended network has been highly uneven, with the development of infrastructures lagging far behind the expansion of the mining industry. Due to its landlocked location, Mongolia relies on Russian and predominantly Chinese ports in order to access the global market. Currently, geopolitical tensions between Russia, China and Mongolia

¹⁴ Ibid., 259.

¹⁵ Li Narangoa, “Mongolia in 2011: Resources Bring Friends and Wealth,” *Asian Survey*, 52:1 (Jan-Feb 2012): 83.

¹⁶ James Ferguson, *Global Shadows: Africa in the Neoliberal World Order* (Durham, NC: Duke University Press, 2006), 204-205.

¹⁷ It should be noted that in comparison to extractive settlements elsewhere in the world, the remoteness of the Gobi means that investment in security measures are less significant than at other more enclave-like foreign direct investment zones in Africa or South America, for instance. Despite increasingly vocal opposition campaigns from local herders who are being displaced by the environmental externalities of mining operations, most Mongolians still believe that the existence of mines like Oyu Tolgoi is necessary for the broader economic development of the country.

are preventing the construction of rail lines and energy grids to efficiently connect the Mongolian mines to these important regional nodes. In 2011, the Mongolian government announced a Russian-funded plan to build a new rail link from the Gobi mining region all the way to Russia (specifically the ports of Vanino and Vostochnyi), in order to avoid an over-reliance on China. This route is much longer and more expensive than simply building a rail link to the Chinese border, costing \$75 per ton rather than the \$15 per ton it would cost to ship exports through China.¹⁸ Following a political uproar, the Mongolian government conceded to the construction of a rail link to the Chinese border, but stated that it would maintain the Soviet-era standard gauge width, thus stopping short of total infrastructural integration with the Chinese.¹⁹ Clearly, despite the increased integration of Chinese and Mongolian markets, national borders do still articulate developments, as Mongolia tries to stop becoming a de facto Chinese satellite.²⁰

The continued lack of a sufficient rail network has led the emergence of an informal road network, enabled by the Gobi's hard gravel surface. In the process, the landscape has undergone a form of urbanization, as it grows increasingly enmeshed within broader processes of economic development — still, it is a distorted and unsustainable mode of development that has degraded desert ecosystems and displaced local herder communities. In August 2011, the insufficient capacity of the regional transport network was dramatically exposed by a massive traffic jam of coal-bearing trucks on the G6 and G7 highways between Inner Mongolia and Beijing. The traffic jam lasted for almost two weeks and stretched over 100 kilometers; the media described it as the longest in world history.²¹

These bottlenecks are caused by the fact that, to use David Harvey's terminology, the new "spatial fix" for efficient capital accumulation in this region is still incomplete — particularly on the Mongolian side of the border, where only 2,000 of 50,000 km of roads are paved.²² Informal networks have developed in the Mongolian Gobi to connect new mines to "rail ports" on the Chinese-Mongolian border where goods can be incorporated into the extant Chinese rail network. At these Chinese-Mongolian border sites, a peculiar phenomenon of "border urbanization" has emerged, with extensive construction taking place to accommodate the

¹⁸ David Andelman, "Across the Mongolian Steppes," *World Policy Journal*, 28 (2011): 114.

¹⁹ "Mongolia to Build Railroad along Gobi desert," *ECoal China*, accessed May 13, 2013 at: <http://en.ecoalchina.com/info/jtys/1045241.shtml>

²⁰ Narangoa, 83.

²¹ "China National Highway 110 traffic jam," *Wikipedia: The Free Encyclopedia*, accessed Mar 14, 2013 at: http://en.wikipedia.org/wiki/China_National_Highway_110_traffic_jam

²² Pedersen, 557.

increase in traffic. Border towns that used to only be open 2 to 3 times a year are now scheduled to turn into 24/7 international free trade zones.²³ Often, projected urbanization patterns and actual population growth are wildly mismatched, leading to the emergence of ghost town settlements in the desert. For instance, since the town of Erenhot opened up to international trade in 1992, its population has increased tenfold — but the newly built city is far too large and expensive for these settlers.²⁴ The ineffective linkages between concentrated and extended modes of urbanization are dramatically exposed by such phenomena.

I now turn to the second process that is currently under way in the Gobi region — the human induced degradation of the landscape and strategies to reverse that degradation. As I explore such developments, I will lay particular emphasis on how they help us to answer our twin questions of “Is Beijing Gobi” and “Is Gobi Beijing?” The development of the Gobi into a productive landscape has led to significant degradation. This is a process that started over 2,000 years ago when deforestation spearheaded by the growth of the Chinese Empire led to the “yellow-ing” of the Yellow River. The early Maoist period also spurred considerable degradation, particularly during the Great Leap Forward of 1958-60 when the number of factories in the country increased fourfold and pollution/deforestation increased concomitantly.²⁵ However, such degradation has accelerated most significantly following the transition to market socialism in the 1980s, which led to a massive surge in industrialization and in agricultural production. In Inner Mongolia, this increased grazing and farming was stimulated by the enclosure of previously common land and policies of commodification and marketization that led to the replacement of nomadic herding by increasingly fixed and intensive practices.

In addition to lifting limits on the size of herds and flocks, the state explicitly encouraged land enclosure and intensification of use, subsidizing the transformation of “sandy wastelands” on the desert border into productive croplands, exempting tax on irrigated wasteland in an effort to stimulate irrigation, and passing a law that required the conversion of cropland to urban uses to be balanced by creation of new cropland elsewhere.²⁶ All these practices have contributed to the increased desertification of the region; it is estimated that Chinese deserts have been

²³ Mark Storry and Alexandra Ashikhimina, “Mongolian Mining,” *Engineering and Mining Journal* (July/Aug 2010), 51.

²⁴ “Erenhot,” *Wikipedia: The Free Encyclopedia*, accessed Mar 14, 2013 at: <http://en.wikipedia.org/wiki/Erenhot>

²⁵ Jianguo Liu and Jared Diamond, “China’s Environment in a Globalizing World,” *Nature*, 435:30 (June 2005): 1181.

²⁶ Hong Jiang, “Cooperation, Land Use, and the Environment in Uxin Ju: The Changing Landscape of a Mongolian-Chinese Borderland in China,” *Annals of the Association of American Geographers*, 94:1 (Mar., 2004): 122.

expanding at a rate of 3600 square kilometers per year since 1998, now encompassing almost 25% of the Chinese landmass.²⁷ As a result, a significant reorganization of settlement patterns is underway. Over 650,000 environmental refugees have been relocated within the inland provinces of China, often forcibly moved into new urban and peri-urban areas further south.²⁸ The dismantling of collective pastoralism in Mongolia and the increase in nomadic herding populations (due to the collapse of Soviet-funded industry) following independence have also contributed to increasingly intensive land use and environmental degradation.²⁹

Desertification in the Gobi region has in turn exacerbated the severity and frequency of dust storms in northern China, extending the socio-metabolic impacts of such capital accumulation processes beyond the confines of the territory to Japan and even to the western United States. From AD 300 to 1949, dust storms struck northwestern China on average every 30 years; since 1990 they have been occurring on an annual basis.³⁰ Northern Chinese cities such as Beijing are particularly susceptible to these storms: the combination of the dust with industrial pollution often causes total urban paralysis.

In order to prevent Beijing from effectively “becoming Gobi,” the Chinese government has been implementing ambitious geo-engineering strategies to reverse the desertification. Such policies, while advertized as “land reclamation” projects, actually significantly alter the landscapes in question. Strategies such as checkerboard grids, windbreaks and trench systems (to prevent water run off) create highly articulated hybrid environments that blur the man-nature divide.³¹ The most significant of these rehabilitation efforts is a massive afforestation project colloquially known as the “Green Wall of China,” considered by some to be the largest ecological intervention in human history. Started in 1978, the project aims to plant nearly 90 million acres of new forest in a 3,000 kilometer strip across northern China to prevent the southward expansion of the deserts. From 1978 to 2003, approximately 58 million acres of grassland have been planted with trees. The creation of a forest buffer around Beijing has been

²⁷ Shixiong Cao, “Why Large-Scale Afforestation Efforts in China Have Failed To Solve the Desertification Problem,” *Environmental Science & Technology* (Mar 15, 2008): 1828.

²⁸ Dong, Chong, Xiumei Liu and K.K. Klein. “Land degradation and population relocation in Northern China,” *Asia Pacific Viewpoint*, 53:2 (August 2012): 165.

²⁹ David Sneath, “Land Use, the Environment and Development in Post-socialist Mongolia,” *Oxford Development Studies*, Vol. 31, No. 4 (Dec 2003): 445.

³⁰ Liu and Diamond, 1183.

³¹ Michael A. Fullen and David J. Mitchell, “Desertification and Reclamation in North-Central China,” in *Ambio*, Vol. 23, No. 2 (Mar., 1994): 131.

given particular emphasis, with the creation of a special sub-program known as the “Taihang Mountains Afforestation Project” that will cover 110 counties in Beijing, Hebei, Henan and Shanxi provinces.³²

Many of the farmers who have been displaced by the desert’s expansion have been reemployed in this afforestation scheme; millions of seeds have also been planted through mechanized techniques such as airplanes.³³ While advertized as land reclamation projects, most of the forests that have been planted are alien species that can be turned into paper pulp or building materials.³⁴ As such, the transformation of these landscapes falls under Leigh Johnson’s concept of “accumulation by degradation,” in that they reconfigure degraded landscapes under new regimes of accumulation — turning polluted areas into sites of further profit-making while simultaneously shrouding such policies in an ecological rhetoric.³⁵

Most of all, however, the creation of such man-made natures is a strategy to ensure the continued viability of the agglomeration. In order to prevent Beijing from being absorbed by the Gobi, the Gobi is thus itself being transformed into a highly artificial, albeit seemingly ‘natural’ extension of the urban fabric. The slogan of the Duolan County government’s reclamation efforts accentuates this relationship: “Controlling a grain of sand in Duolan, achieving a piece of blue sky in Beijing.”³⁶

At present, there is considerable debate as to whether these afforestation schemes are actually succeeding in reversing the desertification process. Many analysts argue that, far from solving the problem, these new, non-indigenous trees are actually exacerbating desertification by further depleting groundwater reserves and by killing off surface vegetation, thus drying the land and making it more susceptible to aridity. Some reports state that up to 85% of these plantings fail.³⁷ Either way, it is clear that research into ways of reducing the severity of dust storms and desertification is a major priority of the Chinese scientific community. The vast majority of the

³² Cao, 1827.

³³ Jon Luoma, “China’s Reforestation Programs: Big Success or Just an Illusion?” in *Yale: Environment* 360 (17 Jan 2012), accessed 27 Feb 2012 at:

http://e360.yale.edu/feature/chinas_reforestation_programs_big_success_or_just_an_illusion/2484/

³⁴ Ibid.

³⁵ Leigh Johnson, “The fearful symmetry of Arctic climate change: accumulation by degradation,” *Environment and Planning D: Society and Space*, 28:5 (2010): 828-847.

³⁶ Sarah Rogers and Mark Wang, “Environmental Resettlement and Social Dis/Re-articulation in Inner Mongolia, China,” *Population and Environment*, 28:1 (Sep., 2006): 45.

³⁷ Luoma.

contemporary academic literature on the Gobi region deals with this problem, demonstrating the severity and scope of these transformations.

A broader theme to be noted at this point is the ways in which both the mining industries and the desertification/dust storms of the Gobi contribute to socio-metabolic impacts far beyond the confines of the region. The coal that is extracted from the Gobi is used to generate power across China and has led to serious air pollution problems that, compounded with the dust storms that are also emerging from the desert, have significant socio-economic consequences. In January 2014, off-the-charts air pollution and limited visibility brought Beijing to a stand-still, grounding flights and disrupting automotive traffic during the peak season of Chinese New Year.³⁸ Moreover, loss of crops and forests due to acid rain is estimated at \$730 million a year.³⁹ The burning of coal is also the primary source of energy production in Mongolian cities and has contributed to air pollution.

The loss of agricultural/pastoral land in northern China due to desertification, as well as recent bans on logging and deforestation, have led to a significant increase in China's imports from abroad. China is now essentially an "exporter" of deforestation, offloading its environmental externalities to countries such as Malaysia, Papua New Guinea and Australia.⁴⁰ It is also a net importer of coal, contributing to the expansion of extractive industries and socio-metabolically destructive processes abroad.

The importation of water into northern China and the Gobi region has also become a major priority in recent years. Mining industries consume a huge amount of water during the extractive process, for dust suppression, mineral processing, coal washing and hydrometallurgical extraction.⁴¹ Due to the fact that the Gobi has a highly arid environment, this has led to considerable depletion of the ground water in the region. As a result, plans are currently underway to reroute water from elsewhere in order to facilitate mining activities. There is an ambitious proposal to reroute waterways in northern Mongolia to service mining operations in the south.⁴² In China, such a geo-engineering mega-project is already under construction in the

³⁸ "China's Air Pollution Again at Danger Levels," *The Guardian* (29 Jan, 2013), accessed 28 Mar, 2013 at: <http://www.guardian.co.uk/world/2013/jan/29/china-air-pollution-danger>

³⁹ Liu and Diamond, 1183.

⁴⁰ Liu and Diamond, 1184.

⁴¹ Bernd G. Lottermoser, *Mine wastes: characterization, treatment, environmental impacts* (New York: Springer, 2007), 91.

⁴² Davaa Basandorj et al, "Technology of Water Transmission Pipeline on Long Distance and Its Application for Gobi and Steppe Regions of Mongolia," *IEEE* (2007): 321.

form of the Y40 billion “South-to-North Water Transfer Project,” intended to transfer 11.7 billion cubic meters of water annually to mitigate water shortages in northern China and Beijing in particular.⁴³ The land reclamation and afforestation projects designed to counter desertification are further exacerbating the water shortage in northern China, contributing to the urgency of completing this hydrologic infrastructure.

In short, it is not just the Gobi that has been expanding in recent years. Beijing has also grown, transforming vast landscapes — both near and far — into an operational buffer zone. The reconfiguration of such degraded areas is a form of extended urbanization, that, far from closing off such areas to economic activity, both displaces such processes elsewhere and preserves the site in question for further exploitation in the future. In much the same way that New York has been described as a city under siege in the aftermath of Hurricane Sandy, Beijing too is responding to new forms and scales of human-induced natural impacts. In the process, the distinctions between Gobi and non-Gobi, city and non-city are growing harder and harder to distinguish.

⁴³ Cao, 1829.

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