

# Trash Islands: The Olympic Games and Tokyo's Changing Environment<sup>1</sup>

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**Abstract:** As preparations for the 2020 Olympic and Paralympic Games continue, largely on islands in Tokyo Bay constructed from reclaimed waste material, the question of the impacts on the environment is of vital importance. While prospective host cities increasingly set forth extensive proposals to hold "Green Games" that will have minimal impact on the natural environment, few, if any, are able to deliver on these promises. Positioning itself as one of the world's leaders in environmental technology and efficiency, Japan is seeking to use the global spotlight of the 2020 Olympics to display and market new models of sustainable development.

## Introduction

In scrolling through the Tokyo 2020 website, one comes across seemingly endless mottos, visions, and concepts, such as "Connecting to Tomorrow," "Unity in Diversity," "Be Better, Together," and the venue plan concept, "Infinite Excitement." As described by the event planners, Infinite Excitement derives from the infinity symbol formed by the spatial layout of the Olympic venues, which is comprised of two adjacent circular zones known as the "Heritage Zone," housing several refurbished 1964 Olympic venues, and the "Tokyo Bay Zone," which "serves as a model for innovative urban development and symbolizes the exciting future of the city." The Athlete's Village is situated at the intersection of these

two zones, "at the physical and spiritual heart of the Games." The five main venues for the Tokyo 1964 Olympic and Paralympic Games (hereafter, 1964 Olympics), some of which are now in the "Heritage Zone," were mainly in central and western Tokyo, intentionally far from the then-sewage-filled and notoriously foul-smelling Tokyo Bay. Today, Tokyo Bay has become the geographic focal point of 2020 Olympic and Paralympic Games (2020 Olympics), and a site of targeted rapid commercial and residential development.

Examining the history of Tokyo Bay's development within the broader history of the Olympics' concern for environmental issues leads to a fuller understanding of how these two histories intersect, and of how the current Olympics-related projects may impact the future of Tokyo Bay. The fragility of the natural environment has become one of the stated prime concerns of both the Olympic Movement and of cities around the world in the twenty-first century. The International Olympic Committee (IOC) has expressed increasing concern over the environmental impact of its events, particularly since the mid-1990s when it officially incorporated sustainability into its Olympic Charter. The Olympics have also become platforms for showcasing models of sustainable development, and nowhere will this be more apparent than at the Tokyo 2020 Olympics. At the same time, the IOC has been accused of so-called "greenwashing" in its sustainability initiatives – that is, articulating a concern for the natural environment while doing little to actually improve environmental outcomes. To provide historical context, I will briefly delve into the history of Tokyo Bay as

well as the Olympics' connection to the environment in Japan before looking more closely at the transformation of Tokyo Bay for the 2020 Olympics.



***Morning Sea at Omori. 1880 woodblock print by Kobayashi Kiyochika. Behind the two seaweed gatherers in Tokyo Bay, two rectangular reclaimed fortress islands (daiba) and a Western ship can be seen. Image in Ulak's visual narrative, "Kiyochika's Tokyo: Master of Modern Melancholy"***

easily watched from towers on the bluff. However, this layout meant that urban development, which happened at a remarkable pace in the 17<sup>th</sup> and 18<sup>th</sup> centuries, required filling in swamps, leveling hills, and bridging rivers (*ibid*, 163).

In the early days of the Tokugawa Era (1603-1868), massive crews of workers were mobilized to re-route and bridge streams, fill swamplands, dredge canals, construct wharf areas, and build major aqueducts in order to get fresh water across the growing metropolis. At the Edo-Tokyo Museum today, visitors can see a roughly three-square meter slice of Tokyo Bay landfill, comprised primarily of sediment mixed with layers of broken shells and thin bamboo woven around thick wooden stakes. Next to the landfill slice, a caption explains that "these remains that were excavated from the historic ruins of Shiodome were the first materials that specifically showed the true condition of how Edo was filled in. [...] Stakes were pounded in diagonally in the direction of the open sea, and then weirs were created by entangling bamboo with the stakes to prevent erosion of the earth and sand that was filled in."

## A Brief History of Tokyo Bay Land Reclamation

Conrad Totman, a respected authority on Japan's environmental history, has written that Tokyo's dynamic growth "deserves special note because in a sense it arose on what was a preposterous site for a city" (Totman 2016, 162). When Tokugawa Ieyasu established his new regime and headquarters in a castle in Edo (now Tokyo) at the turn of the 17<sup>th</sup> century, the location made sense. Edo was made up of low bluffs with a wide vista of Edo Bay, shielded from naval assault by a huge strip of swamp. Rivers to the north and south offered natural barriers, and the flat areas to the west could be



**“Slice of Tokyo Bay landfill taken from Shiodome on display at Edo-Tokyo Museum” Photo by author in July 2019.**

As Tokyo’s population continued to grow into the 19<sup>th</sup> and 20<sup>th</sup> centuries, Tokyo Bay continued to shrink as the coastline was built out and new islands emerged.<sup>2</sup> From its natural coastline to the present day, the stages of large-scale land reclamation in Tokyo Bay can be roughly broken down into four periods:<sup>3</sup>

1. The Tokugawa Era (1603-1868), when canals were dredged and major infrastructure projects were carried out to accommodate the most rapidly-growing urban population in the world. Six small defensive island fortresses called *daiba* (“fort”) were built off the coast of Tokyo in 1853-4 as the period of Japanese isolationism ended and in

response to American gunboat diplomacy.

2. 1920s-40s: After the Great Kantō Earthquake of 1923 and the destruction of Tokyo by firebombs in World War II, debris was pushed into the bay to create piers and islands, including Hinode, Ariake, and Harumi.<sup>4</sup> These newly-constructed piers were used to get necessary supplies in and out of the metropolis following the devastation.
3. 1960s-70s (High-speed economic growth): Wharfs were expanded and new islands were built, many of which housed facilities to provide energy to the city, such as Toyosu, and to serve as massive landfills for the city’s trash, such as Yumenoshima. At the same time, domestic and international environmental crises, along with Tokyo’s hosting of the 1964 Olympics, prompted cleanup efforts in the bay.
4. 1980s-present: The area has transitioned from primarily industrial to primarily recreational with the Tokyo Waterfront Subcenter (*Tōkyō rinkai fukutoshin*) development, a flagship plan spearheaded by the Tokyo Metropolitan Government in the mid-1980s.<sup>5</sup> Though the plan sputtered and stalled amidst the bursting of the economic bubble in 1990, after the 2013 announcement that Tokyo would host the 2020 Games, the area was targeted for development into a “smart city.”

Before looking more closely into this last phase of development, and into how and why Tokyo Bay became the area of the most concentrated construction and development for the 2020 Olympics, a brief review of the longstanding relationship between the Olympics and the environment in Japan may be helpful in placing the current moment into a clearer historic context.

## “Green Games” in Japan

The IOC “officially” started discussing the environment in the 1970s, and Japan features prominently in the early narrative of sustainability and the Olympic Movement. Sapporo’s 1972 Winter Olympics was the first Olympic Games to have environmental issues incorporated into the official post-Games report disseminated by the IOC. In this report, officials wrote: “Since the downhill courses were to be located on the slopes of Mt. Eniwa, [...] the clearing of virgin forest and the alteration of the original geographical features came into question, a matter which also gave rise to not a little objection from the public. It was recognized, however, that Mt. Eniwa was the only mountain within easy access of Sapporo which could meet the conditions required for the downhill courses. Consequently, the government offices concerned, with the consent of the Natural Park Council, granted their permission for the course, on the condition that all the related course facilities be removed and that the terrain in the affected area be permanently restored to its original state” (IOC Official Report 1972, 246).<sup>6</sup> This account offers a glimpse at the tensions and complexities that organizing committees face when trying to carry out environmentally-conscious Olympics. The demands for Olympic-standard facilities, and efforts to hold “compact” events requiring less new infrastructure for transport can clash with demands for environmental conservation. While the 1972 IOC report marks an important inflection point for the IOC’s recognition of the environment, it was not the first time that the environment had factored into Olympic planning in Japan.

Evidence indicates that as far back as the 1930s, organizers of the Olympic Games were concerned with cleaning up Japan’s environment (and image) for the influx of international guests that the Olympics draw. Cleanup campaigns in schools and communities

were prompted by both industrial catastrophes in the late Meiji Era (1868-1912),<sup>7</sup> and the awarding of the 1940 Olympic Games, which were ultimately cancelled due to World War II (Pyle 1975, 349 and Miller et al 2013, 225). As recalled by writer and literary critic Okuno Takeo in a *Yomiuri* article titled “Olympic Praise” (*Orinpikku san*), he and his elementary school classmates were required to participate in cleanup efforts during the school day in 1938 in preparation for the 1940 Olympics (Kōdansha Bungei Bunko 2014, 262).<sup>8</sup> Concerns over the felling of trees and destruction of the Meiji Shrine Outer Gardens’ “scenic beauty” also led organizers to designate Komazawa (in western Tokyo) as the center of Olympic activity for the 1940 “phantom” event (Collins 2017, 120). Of course, this “scenic beauty” would later be disturbed by the construction, demolition, and re-building of the National Stadiums for the 1964 and 2020 Olympics.

The 1964 Olympics are often remembered as a pivotal catalyst for environmental cleanup efforts in Tokyo, particularly as the event was one of the first to be widely broadcast on network television, and would thus show off a clean and modern post-WWII Japan to the world. In advance of the 1964 Olympics, major initiatives were launched to address Tokyo’s multifaceted environmental problems, from industrial contamination, to sewage in Tokyo Bay, to noise and tobacco pollution, to infestations of flies and mosquitoes (Tōkyō to Orinpikku Junbikyoku, 1961).

In part because of the extensive efforts to clean up and modernize Tokyo’s physical environment, the 1964 Olympics are typically remembered as a major success. Worldwide interest was drawn to Japan’s “bullet train,” inaugurated just a week prior to the opening of the Olympics in October 1964, along with an innovative new monorail and an extensive network of modern highways to facilitate transportation during and after the Olympics. However, the 1964 Olympics also came at a



significant environmental cost. As American author Robert Whiting, a longtime resident of Japan, has written, the massive construction for the 1964 Games exacted a terrible toll on the rivers of Tokyo. Whiting observed that “By planting supporting columns of the highways and other structures in the water below, many river docks were rendered useless [...], water stagnated, fish died and biochemical sludge, known as *hedoro* in Japanese, formed” (Whiting 2014).



**Waterway under a highway in Minato Ward, Tokyo, 2019. Photo by author**

Others have also noted the dramatically negative impact of Olympics-related construction on Tokyo’s important maritime environment. Dr. Jinnai Hidenobu, an expert on the history of Tokyo’s waterways, states, “The Tokyo Olympics in 1964 decisively caused the loss of Tokyo as a ‘water city.’ Tokyo’s water quality got worse because of the pollution. Highways covered many waterways, Tokyo Bay, industrialization, traffic, transport... these are the reasons that people became distanced from the water” (Jinnai quoted in Reith-Banks 2019). The era of high-speed growth not only wreaked havoc on Tokyo’s waterways, but changes in

daily life led to about half of all human waste and literal mountains of trash being deposited directly into Tokyo Bay, located nearby but on the periphery of the city center (Siniawer 2018, 83).

One of these mountains of trash was incongruously named the Island of Dreams (*Yumenoshima*), and its transformation from a landfill teeming with rats and flies (deemed a public health crisis in 1965), to a sanitized, artificially-created island that will host Olympic events in 2020 illustrates a broader current trend in Tokyo Bay.<sup>9</sup> In this final section, I will discuss the rapid and remarkable transformation of Tokyo Bay in preparation to host the Summer Olympics again in 2020.<sup>10</sup>

### “Rebirth With New Appeal”

Throughout the 1960s and 70s, facilities necessary to support a thriving metropolis, such as sewage treatment plants, trash incinerators, concrete plants, energy plants, and hazardous material storage tanks were built in Tokyo Bay and led to malodorous and dangerous conditions. By the early 1970s, these conditions, along with a string of high-profile industrial pollution crises around Japan (including Minamata disease and Yokkaichi asthma), resulted in some of the world’s strictest environmental regulations, and eventually helped improve water quality in and around Tokyo Bay (Jinnai 2017, 216).

In 1986, the Tokyo Metropolitan Government (TMG) unveiled its multi-polar metropolis “Tokyo Teleport Project,” a partnership between the government and private corporations to develop a new urban center on reclaimed land in Tokyo Bay, and to reconfigure a primarily industrial area to one in which people could live, work, and enjoy leisure activities (Saito 2003, 295-301). As a consequence of this rapid and far-reaching transformation, Tokyo Bay would suffer

environmentally and aesthetically. For example, in order to construct durable structures that could withstand earthquakes (and the liquefaction effect that can occur on reclaimed land), the bay area came to be comprised of huge tracts of soulless concrete, much of which was made using slag produced through burning and processing trash into cement (Clean Authority of Tokyo Waste Report 2019, 8-10).<sup>11</sup> At the conclusion of his *Tokyo Rising*, Edward Seidensticker writes in the late-1980s, “The picture [of Tokyo in the future] contains little if anything that offers hope to the middle class, now being driven to the far suburbs and the neighboring prefectures. Nor is it an aesthetically pleasing picture. Such of the filled lands in the bay as have already been built upon can only be described as bleak. One mile of dust and concrete leads to another” (Seidensticker 2010 (2<sup>nd</sup> edition), 604). These sentiments were shared by others. According to professor of Urban Studies Saito Asato, in the early 1990s, “serious concerns were raised about the environmental impact, the number of housing units, and the reckless pace of the development in the Tokyo Metropolitan Assembly” (Saito 2003, 297). Though some company headquarters were built in the new sub-center (including, notably, the Fuji Television Building, completed in 1996 and designed by Kenzo Tange Associates),<sup>12</sup> development of the area stalled after the bursting of the economic bubble in the early-1990s and into the 21<sup>st</sup> century.

生まれ変わる新たな魅力へ

Rebirth with New Appeal

ふ頭再開発計画  
Terminal Redevelopment Plan

豊洲・晴海地域は、戦後の東京の発展を支えてきた港湾物流施設の移転・再配置、エネルギー関連施設の機能縮小・停止などにより、大規模な未利用地が多く存在しています。また、この地域は、都心と臨海副都心の中間に位置するという特性を有しています。東京都は、これらの点を踏まえ、この地域において活力ある複合市街地の形成を目指すこととし、業務・商業、居住などの都市的な土地利用への転換の取組を進めています。

(開発目標)

- 1 職住近接の都市型居住のまちの形成
- 2 業務・商業、居住、文化などが調和した複合市街地の形成
- 3 水辺の魅力を生かした文化と交流のまちの形成



There is vast amount of unused space in the Toyosu-Harumi area due largely to the relocation and redeployment of the port distribution facilities that once supported growth in postwar Tokyo and the reduction or termination of the functions of energy-related facilities. This area has the added feature of being located halfway between Tokyo Waterfront City and the heart of the city. Aware of this potential, the Tokyo Metropolitan Government is pursuing the formation of a dynamic urban complex here while promoting efforts to transform the area for business, commercial and residential use worthy of the urban environment.

Development goals

1. Creation of an urban community that will bring the workplace and the residence in closer proximity
2. Formation of an urban complex harmonizing business, commercial residential, cultural and other elements
3. Creation of a community of attractive waterfront cultures and for interaction of people

“Rebirth with New Appeal.” Tokyo Metropolitan Government’s Redevelopment Plan for the bay area, specifically Toyosu (where the former Tsukiji fish market was moved) and Harumi, where the Olympic Athlete’s Village is located. Source: Tōkyō to Kōwankyoku (Tokyo Metropolitan Government Bureau of Port and Harbor), “Port of Tokyo 2019,” 40

Thus, in 2007, when Tokyo officially announced that it would bid to host the 2016 Summer Olympics, the largely-unused bay area was targeted by the TMG as a zone for development (IOC 2009), 28).<sup>13</sup> Though Tokyo would lose that bid to Rio de Janeiro, many of the plans laid out in that bid file would resurface in 2011, when Tokyo launched another Olympic bid. The 2020 bid commenced mere months after a massive earthquake, tsunami, and nuclear plant meltdown rocked the country, and some have speculated that these disasters mobilized stronger public support (both in and outside Japan) under the banner of hosting a “Reconstruction Olympics” in 2020 (Himmer 2011, Roberts and Whiting 2016). In the time since Japan won the bid in 2013, TMG’s plan to

rapidly develop the bay area into a “smart city” has been realized, with the majority of new Olympic infrastructure concentrated in this zone which the organizers hope “serves as a model for innovative urban development and symbolizes the exciting future of the city” (TOCOG 2020, “Venues”).<sup>14</sup>



The Olympics serving as a model for innovative development is a theme that underscores many sustainability initiatives featured prominently in the rollout of the 2020 Olympic Games. One can easily critique Olympic planners of greenwashing, as initiatives like medals made from recycled electronics and athlete beds made from recyclable cardboard do not address critical, big-picture environmental issues in any meaningful way. Moreover, many creative suggestions that would considerably reduce the carbon footprint and the broader environmental impact of the Olympics (such as

holding the event in a small number of rotating host cities) seem to go unheard by the IOC (Friedman 2016).

That said, while the Olympics may not benefit the environment, and in many cases are destructive for the host city, it is worth considering possible outside effects on future environmental efforts, including outside the Olympic context in everyday life. Sport sociologist John Karamichas has noted that “the Games [...] operate as showcases for the internationalization of environmental values and norms, with a wide mimetic potential in both geographic and public policy sector terms.” (Karamichas 2013, 97). In other words, the Tokyo 2020 Olympics can serve as a platform for Japanese companies to take a global lead in sustainable technologies, potentially serving both the corporate bottom line and the future of the planet. Whether this optimistic prediction is realized, of course, remains to be seen, as complex economic and ecological cost-benefit analyses of the 2020 Olympics may take decades to unfold.

Recently, in order to learn more about the processes of converting Tokyo’s burnable trash into usable cement, I visited several of Tokyo’s 21 incineration plants.<sup>15</sup> One of these facilities, the Shin-Koto Incineration Plant, not only converts trash into materials for land reclamation, but uses energy from the trash-burning to provide power and heat to adjacent Olympic facilities on Yumenoshima. This process of converting trash burned at extremely high heat (800°C/1472°F) into cement and usable energy (while also filtering out toxins) is costly and may not yet be a feasible waste disposal option for many societies. That said, with the future of coastal cities around the globe threatened by mounting environmental crises, perhaps such solutions will be more widely adopted after Japan’s 2020 Olympic showcase of innovation in sustainable development. As athletes, spectators, and media descend upon Yumenoshima this



summer for Olympic archery and water polo competitions, perhaps their attention will also be drawn to their surroundings, revitalized from the formerly-bleak landfill that stood there during Tokyo's 1964 Olympic Games.



**Two vantage points of Yumenoshima from the Shin-Koto Incineration Plant: 1] Behind a grassy park, treated ash is deposited into the bay to create more reclaimed land. In the background, the exhaust stack from a sewage sludge treatment plant is visible.**



**2] The Yumenoshima Tropical Greenhouse and Sports Culture Center are the rounded buildings in the foreground. Not visible but directly behind them are two Olympic venues, the archery field and the Tatsumi International Aquatic Center - all four facilities utilize power generated from the burning of trash at the Shin-Koto Incineration Plant. Photos by author in July 2019.**

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## Notes

<sup>1</sup> Research for this article was carried out in the summer of 2019 with support from the Japan-U.S. Educational Commission (Fulbright Japan)

<sup>2</sup> As Tokyo's human population ballooned, the marine population also dwindled. For most of recorded history, Edo Bay and its rivers were celebrated for their abundance of fish, shellfish, and high-quality seaweed. By the 1920s and 30s, industrial pollutants withered the fishing industry in Tokyo Bay and its rivers. Totman writes, "by the 1940s, the once-splendid fisheries and seaweed fields of Tokyo Bay's western side were largely destroyed, and in following decades the combination of pollution and landfill would complete the Bay's biological ruination" (Totman, 227). Several other sources report that Tokyo Bay was completely contaminated and incompatible with marine life by the 1970s.

<sup>3</sup> The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) produced a good visualization of these stages of development [here](#).

<sup>4</sup> In June 2019, an unexploded American bomb from WWII was discovered and removed during construction for the 2020 Olympics on the reclaimed island of Ariake (See [here](#)).

<sup>5</sup> The 3 main objectives of this development plan were: 1) To create a multipolar urban layout that avoided the overconcentration of businesses in the existing city center; 2) To adjust to the new information era by developing facilities for information exchange such as convention centers; 3) To build an ideal city for working, living, and leisure, where environmental concerns and future technology could coexist (Saito 2003, 295)

<sup>6</sup> also quoted in Boykoff 2017, 180-1

<sup>7</sup> Deforestation has been one of the persistent environmental problems in Japan since the turn of the 20<sup>th</sup> century, exemplified by the Ashio Copper Mine Pollution case (Pyle 1975, 349).

<sup>8</sup> Okuno writes, "In 1938, for the coming 12<sup>th</sup> Olympiad and so-called Foundation Day, we elementary school students were indoctrinated to believe that it would be shameful for us Japanese, the best ethnic group in the world, to reveal our embarrassing habits to the foreigners such as leaving trash around the audience seats." (Okuno in Kōdansha Bungei Bunko 2014, 262)

<sup>9</sup> For a detailed and nuanced account of the public health crises on and around the Island of Dreams in the 1960s, please see Siniawer, pages 84-85.

<sup>10</sup> Though they go beyond the scope of this article, the Winter Olympics of 1972 and 1998 also offer important examples of lasting environmental damage brought about by Olympic development in Japan.

<sup>11</sup> To learn more about the process of converting trash into cement, see [the 8-minute video](#) (in Japanese or English) produced by the Clean Authority of Tokyo (which handles the city's waste disposal).

<sup>12</sup> Architect Kenzo Tange is perhaps best-known as the designer of the Yoyogi National Gymnasium for the 1964 Olympics. This facility will again be used in the 2020 Olympics. In a noteworthy example of continuity, the architecture firm now run by Kenzo's son Paul Noritaka Tange (Tange Associates) has designed the new Olympic Aquatics Center for the 2020 Games.

<sup>13</sup> The IOC report states: "Tokyo's vision is 'Uniting our Worlds,' combining vitality and sustainability, heritage and innovation in line with Tokyo's 10 year (2007-2016) urban planning strategy, 'Tokyo's Big Change – The Ten Year Plan.'" The Tokyo Metropolitan Government website also highlights the 2006 formulation of "Tokyo's Big Change" as a major event in Tokyo's timeline on [its website](#).

<sup>14</sup> In 2016, The Tokyo Metropolitan Government released a new JPY 1.42 trillion 4-year plan ("[New Tokyo. New Tomorrow. The Action Plan for 2020](#)").

<sup>15</sup> A map and list of Tokyo's incineration plants are on the [Clean Authority of Tokyo's website](#).