An Analysis of the Cheonggye River Restoration Project Using the Theory of Technological Politics

STS Research Paper

Presented to the Faculty of the

School of Engineering and Applied Science

University of Virginia

By

Kaila Stein

April 10, 2020

On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

Signed: _____

Approved: _____ Date _____

Benjamin J. Laugelli, Assistant Professor, Department of Engineering and Society

Introduction

For 46 years in Seoul, South Korea, there was a six-lane highway that cut through the heart of the city. This highway created air and noise pollution and increased city temperatures. However, before this highway there was a river called the Cheonggye River that had weaved its way through this part of the city before being covered up. This river became the focus of the new Mayor in 2002 who ran on a platform of improving the local environment by restoring the river to its original location and creating a park with green areas and walkways around the river bed.

As it came to be known, the Cheonggye River Restoration Project (CRRP) was completed in 2006 and is usually viewed as an extremely successful environmental restoration project: the city removed an unsightly, polluting highway to allow a river to return to its original river bed, improving the local environment. The project is touted as an example to be looked to by other cities looking to make improvements. However, this interpretation ignores the more complicated fact that the river restoration also did significant social and political work when it was created. In fact, the Cheonggye River Restoration Project caused gentrification that pushed lower-income people and industrial businesses out of the area to make way for high-income, educated people and the commercialism that they desire. Drawing on the theory of technological politics, I argue that the river restoration shapes power relations by privileging some and marginalizing others. I believe that examining the Cheonggye River Restoration project through the lens of technological politics will provide a means of judging the inherent politics of the technology of inner-city river restorations.

Background

In 2003, the Seoul Metropolitan Government began the destruction of an elevated six lane highway that ran through the center of the city. By 2006, there was a beautiful restored river

in the place of the highway created using the technology of river restoration. River restoration is a broad term describing a wide set of environmental engineering practices used to rehabilitate damaged streams. This new river area had ample plants and green space, the sounds and sights of running water, and walkways to encourage physical activity. Although some were worried about the effect this would have on traffic, traffic studies have shown that it actually improved the flow of traffic in the city. In addition, the air and noise pollution have decreased in the area, and it is a much more desirable place than before. This increase in desirability, however, caused adverse effects in the social landscape and caused gentrification.

Literature Review

Many scholars have reported on the positive environmental benefits of the CRRP and have touted it as an environmental success. There are fewer scholars who have reported on the gentrification effects of this restoration project. However, when they have reported on the gentrification, they have not offered any judgement on the technology's role in shaping the power dynamics between social groups.

In a long-term environmental study by Kim et al., the environmental benefits of the stream restoration are inspected. By analyzing the temperature and humidity in the area surrounding the highway before the restoration and then after the restoration, they collected data on the effects that restoring the river had on the environment. This study showed that the river restoration project caused the temperature in the area to decrease by 0.4 degrees Celsius, reducing the urban heat island effect, which is the tendency for urban settings to be significantly hotter than rural areas (Kim et al., 2009). The urban heat island effect plagues many inner cities and makes heat-related deaths more common in inner cities than in rural areas with the same

climate (Kim et al., 2009). However, while these environmental benefits are important, they do not encompass the full range of effects of the restoration project.

A study by Lim et al. looked at the land use pattern changes in Seoul in the neighborhoods surrounding the river restoration project. According to Lim et al. (2013), the CRRP had the effect of moving industrial businesses and people of low socioeconomic backgrounds out of the area and allowing commercial businesses and more affluent residents to move in. By analyzing the four mega-blocks surrounding a section of the restoration project, they discovered that the redevelopment that occurred in the area caused a shift from industrial sites to commercial sites and office uses. Lim et al. say that this also symbolizes a shift towards more affluent users, with 65% of land use changes being commercial sites such as retail, restaurants, bars, cafes and educational facilities. However, they make no comment on the technology of river restoration itself being the cause of these changes, but rather notes that they have occurred in the aftermath of the project.

Blaž Križnik builds upon this research by noting the cultural loss experienced in the area around the CRRP. He describes the loss of social gathering spaces and markets with rich cultural ties that existed before the restoration project (Križnik, 2011). He goes on to describe the loss of traditional jobs in the area and an increase in private urban development. However, Križnik, as with Lim et al., makes no comment on the technology of river restoration itself. Križnik instead focuses on the policy of urban revitalization as the factor causing these changes.

Scholars have not yet argued that the properties of the technology of river restoration caused the changes in these social and power dynamics. I will be arguing against the idea that the technology of river restoration is neutral in relations of power between groups by showing that

the inner-city CRRP project was an inherently political tool used to purposefully gentrify and change the social landscape of the surrounding area.

Conceptual Framework

The Cheonggye River Restoration Project can be analyzed using the theory of technological politics which will allow me to examine the social and political effects of the CRRP. Created by Langdon Winner in 1980, technological politics focuses on examining the ways in which technologies are inherently political and how they shape power dynamics between groups. The word "politics" in this context does not mean having to do with politics, but rather "the arrangements of power and authority in human associations as well as the activities that take place within those arrangements" (Winner, 1980). Winner goes on to speak about the how technologies can create power divides within society by privileging some and marginalizing others. According to Winner, these technologies "build order in our world" simply by existing.

Winner also speaks about the intentionality behind the creation and utilization of certain technologies and how this can settle issues in a community. Winner says, "The issues that divide or unite people in society are settled not only in the institutions and practices of politics proper, but also, and less obviously, in tangible arrangements of steel and concrete, wires and transistors, nuts and bolts." He points to the fact that technologies can be utilized to create certain power dynamics in communities in ways that are not obvious, but real nonetheless. Therefore, certain technologies can be purposefully wielded by their creators to cause certain outcomes in society.

In order to use technological politics to analyze the case of the CRRP, I will first look at the stated intents behind the use of the technology, then at the effects of the implementation of the technology, including privileging of the wealthy and the marginalization of the poor, while also analyzing the inherent qualities of the CRRP that caused these effects.

Analysis

I will use the theory of technological politics to analyze the Seoul city government's stated intent of using the technology of stream restoration, the effects that this technology had on the power dynamics between social groups, and the qualities of river restoration that caused these effects. Specifically, I will argue that the river restoration marginalized people of low socioeconomic status and privileged the wealthy by being a beautiful, and healthy artifact that is attractive to all, but only accessible by the wealthy. By doing this, I will show that the Cheonggye River Restoration Project is an inherently political device that changed the social layout of the area surrounding it.

Intent Behind Using the Technology

The first evidence that the river restoration marginalized people of low socioeconomic status and privileged the wealthy is that the creators of the project stated that this was one of the goals of the project. While one of the goals of the CRRP was environmental improvement, a goal that was achieved through improved water quality and reduced urban heat island effect (Hyea-Ju et al., 2006), this was not the only goal of the project. Since this restoration project lay in the heart of downtown Seoul, the government saw an opportunity to use the project to achieve other political and social goals. This becomes clear when analyzing the language that the government and the Mayor used to speak about the project. When speaking about this project, Seoul Mayor Myung-Bak often used phrases describing the project as an "educated, upper-class revitalization," and described the area as a future "international tourist landmark." (Kane, 2003). The goals had clearly shifted from simply improving the environment to a social goal of creating an area that is attractive to not only upper-class people, but also international tourists. This shows that river restoration was chosen with forethought as a project that could achieve these goals.

The city government expanded upon this by stating that “once the stream is restored, we want this area to stand out as a center of foreign investment. The ultimate goal is to make Seoul a great city, one that can compete as an attractive center of business with Shanghai, Tokyo and Beijing” (Kane, 2003). This quote emphasizes that the government aimed to use the project to change the area around it into an area that would attract foreign investment in order to fit their vision of Seoul as a business capital. By stating this outright, the government makes it clear that this is far from an environmental project as some have argued, but rather a far-reaching project intended to attract wealthy foreign investment and to have certain social and political effects.

The river restoration itself became the means by which the city decided to create this social landscape favoring tourists and the upper-class population while attracting foreign investment. The fact that the government anticipated the implementation of this technology to have these effects shows that the technology itself has inherent properties that would favor these social groups over others. The intent shows that there are certain social consequences that are inherently tied to the technology of river restoration.

Increasing Desirability through River Restoration

The technology of river restoration was able to shape the area in favor of wealthy residents, tourism, and commercial business because it creates a more desirable natural area that is attractive to humans and has positive health benefits. The restoration project brought a natural landscape to a place where there wasn’t one before. Not only was the river restored, but the area around it was turned into a beautiful park, creating blue and green space in the center of a nature-devoid city. The intrinsic values of the river restoration that caused the increased desirability include the mental, physical, and social health benefits of living near natural spaces. The increase in desirability led to the gentrification that occurred.

The health benefits of proximity to green and blue spaces are widely studied in literature. There have been consistent studies that have shown that blue spaces, meaning water features, in urban environments have positive health benefits such as reducing stress and improving general well-being (Gascon et al., 2017). According to Gascon et al. (2017), who did a systematic review of quantitative studies on the issue of blue spaces relating to health, the strongest associations are with improved mental health, well-being, and the promotion of physical health. These health benefits create a setting that is more desirable to people deciding where to live and work. There are even mental health benefits for simply being able to see blue spaces from where you live (Garrett et al., 2019), which can explain why the demand for apartments in the areas adjacent to the river restoration would increase. Apartments and work spaces with views of the new river not only have beautiful views, but also associated with better mental health and therefore highly desirable.

In addition to this, since the river restoration also included adding planted green space into the city, the residents also gain benefits associated with green space such as improved general health and improved safety (Hunter et al., 2019). The perception of an area's health and safety are factors that people consider when determining where to live. There are also mental health benefits from simply the existence of nearby parks, with mental health benefits increasing with people's proximity to the parks (Sturm & Cohen, 2014). Therefore, those people who get to live closest to the parks, such as the CRRP, reap the most benefits from the space. Especially in an urban setting like Seoul where nature is generally hard to come by, the benefits of additional green and blue space are desired.

Many of the benefits from nature are explained by the Attention Restoration Theory (ART), created in 1995 by Kaplan. According to this theory, humans enjoy spending time in

nature because it offers soft fascination, which is the ability of nature to hold attention lightly, in a way that allows the brain to address unresolved thoughts that would otherwise be a drain on focus (Kaplan, 1995). Since humans find nature to be beautiful and it provokes a sense of wonder inside of humans, this allows people to feel relaxed and restored after visiting a natural environment. Since people enjoy both seeing and being in nature, being close to nature has high pay-offs. Humans are drawn to nature, but in this case only those who could pay enough were able to live and work in close proximity the space, which explains why wealthy people were favored by the river restoration.

The addition of blue and green space is intrinsic to a river restoration project. River restoration will always involve an increase in the quality or quantity of green and blue space in an area. Since this improvement provides all of the benefits described above, it is clear that this technology causes the increase in desirability. These natural spaces favor those who live and work nearest to them, providing these people with the most benefits. The low-income residents who were forced out do not get to experience these benefits, while the new, wealthy residents of the area bask in the health benefits of the stream restoration. This unequal distribution of benefits empowers the wealthy and marginalizes the poor.

Shifting Power Dynamics

This restoration project had a drastic effect on the makeup of the surrounding neighborhoods by pushing out people of low socioeconomic status to make way for wealthier people who were attracted to the new beautiful riverfront area. Before the restoration project, the neighborhood was a low-income area with a variety of industrial businesses (Lim et al., 2013). After the restoration, these people were pushed out by rising rent prices due to the increasing

desirability of the area. In fact, the land prices in the surrounding areas increased by 35-80%, depending on proximity to the stream and office rent prices increased by 20% (Lim et al., 2013). This pushed out the industrial businesses and low-income residents who couldn't afford the increasing rent prices, favoring the wealthy residents and commercial businesses who took their spot.

In addition to the land price increase, the job market in the area changed. Before the project, there were about 60,000 shops in the local flea market that employed a total of 800,000 workers (Lim et al., 2013). After the project, the Cheonggyecheon flea market essentially vanished and only 700 street vendors were left in the flea market by 2011 (Lim et al., 2013). The flea market was associated with affordable goods that provided income and a place to shop for many of the low-income residents in the area. When it vanished, so did many low-income jobs. The makeup of businesses in the area also changed, shifting from companies in the manufacturing industry to more commercial industries like shops and restaurants (Lim et al., 2013). These shifts left fewer work options for the low-income residents in the area, causing them to need to leave the area to find work.

The wealthy population, commercial businesses, and tourists were privileged by thie restoration. The wealthy saw an increase in desirable amenities; a healthy, beautiful riverfront neighborhood with a blossoming commercial area, and began to move to the area (Lim et al., 2013). Once they were there, they were able to benefit from the environmental improvements from the restoration created. Furthermore, the commercial businesses that previously would not have been successful in the industrial zone were able to create successful businesses as the population changed and gained wealth (Križnik, 2011). Tourists are the last group that saw marked privilege from this project. Before the restoration, the area was largely unvisited by

tourists, but today it is a completely different story. Today, over five hundred thousand tourists visit the Cheonggye River every day, enjoying the beauty of the restored river and bringing business to the new commercial sector of the area (Lim et al., 2013). These three sectors are all privileged in this case because they are all interconnected and benefit one another. Since the restoration project attracted wealthy people and tourists, the commercial industry was able to thrive, which therefore attracted more of these types of people. A beautiful natural landscape with the addition of a nice downtown shopping and dining area is highly desirable to wealthy residents. This created a self-sustaining loop that continued to gentrify the area and push more of the original inhabitants and industries out.

I have examined evidence that shows the marginalization of low-income people and industrial businesses, arguing that this is a case of gentrification. However, some have argued that the stream restoration was in fact a positive case of urban revitalization, due to the health and beauty benefits of the river restoration that are discussed above. While it is true that some sectors, such as entrepreneurs and the tourism industry, saw an increase in growth in the wake of this restoration, calling it a revitalization is ignoring a whole sector of the population and the business community (Križnik, 2011). Urban revitalization and gentrification are words that describe the same phenomenon, however urban revitalization only focuses on the positive outcomes for certain populations while ignoring the negative outcomes for others (Slater, 2006). This project pushed out people of lower socioeconomic backgrounds and this cannot be ignored when looking at the impacts of the restoration. By glossing over these people and industries and simply looking at the positive outcomes of the restoration, the analysis is not robust enough.

Conclusion

I have argued that the technology of river restorations used in the Cheonggye River Restoration Project is inherently political because of the stated intent of its use and the social effects that it had on the surrounding community. These social effects include marginalizing people of low socioeconomic backgrounds while privileging the wealthy population. This highlights the care with which large-scale stream restoration projects must be implemented. This is important for civil and environmental engineers to understand when they employ these types of technologies in future projects, especially in areas with populations that are vulnerable to the effects of gentrification. This is not to say that river restoration projects should not be pursued, as their environmental benefits are surely a positive. However, it is important for the engineers that take on these projects to learn from the past and know that these projects can affect the social landscape of a city and to take care when wielding the technology of stream restorations.

References

Garrett, J. K., White, M. P., Huang, J., Ng, S., Hui, Z., Leung, C., Tse, L. A., Fung, F., Elliott, L. R., Depledge, M. H., & Wong, M. C. S. (2019). Urban blue space and health and wellbeing in Hong Kong: Results from a survey of older adults. *Health & Place, 55,* 100–110. https://doi.org/10.1016/j.healthplace.2018.11.003

Gascon, M., Zijlema, W., Vert, C., White, M. P., & Nieuwenhuijsen, M. J. (2017). Outdoor blue spaces, human health and well-being: A systematic review of quantitative studies. *International Journal of Hygiene and Environmental Health*, *220*(8), 1207–1221. https://doi.org/10.1016/j.ijheh.2017.08.004

Hunter, R. F., Cleland, C., Cleary, A., Droomers, M., Wheeler, B. W., Sinnett, D., Nieuwenhuijsen, M. J., & Braubach, M. (2019). Environmental, health, wellbeing, social and equity effects of urban green space interventions: A meta-narrative evidence synthesis. *Environment International*, *130*, 104923. https://doi.org/10.1016/j.envint.2019.104923

Hyea-Ju, K., Sung-Hwan, K., & Song-Yee, K. (2006). Changes in Water Quality, Flora and Vegetation of Cheonggye Stream Before, During and After its Restoration. *Korean Journal of Environment and Ecology*, *20*(2), 235–258.

Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology*, *15*(3), 169–182. https://doi.org/10.1016/0272-4944(95)90001-2

Kim, K. R., Kwon, T. H., Kim, Y.-H., Koo, H.-J., Choi, B.-C., & Choi, C.-Y. (2009). Restoration of an inner-city stream and its impact on air temperature and humidity based on long-term monitoring data. *Advances in Atmospheric Sciences, 26*(2), 283–292. https://doi.org/10.1007/s00376-009-0283-x

Križnik, B. (2011). Selling Global Seoul: Competitive Urban Policy and Symbolic Reconstruction of Cities. *Croatian Sociological Review, 41*.

Lim, H., Kim, J., Potter, C., & Bae, W. (2013). Urban regeneration and gentrification: Land use impacts of the Cheonggye Stream Restoration Project on the Seoul's central business district. *Habitat International*, *39*, 192–200. https://doi.org/10.1016/j.habitatint.2012.12.004

Slater, T. (2006). The Eviction of Critical Perspectives from Gentrification Research. *International Journal of Urban and Regional Research*, *30.4*, 737–757.

Sturm, R., & Cohen, D. (2014). Proximity to Urban Parks and Mental Health. *The Journal of Mental Health Policy and Economics*, *17*(1), 19–24.

Winner, L. (1980). Do Artifacts Have Politics? *Daedalus*, *109*(1), 121–136. JSTOR.