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30 Years after the Sampoong Department Store Collapse: Development of South Korean Building Sector

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ABSTRACT

Since 1953, South Korea has experienced an astonishingly rapid and advanced development to the economic powerhouse that it is today. The export-oriented economy flourished in the 80s and the 90s, with construction and building projects developed throughout the country, improving the lives of many people. However, with rapid industrialization came a cavalier attitude towards safety in the booming building sector under the oversight of ineffectual government regulation, finally leading to the infamous Sampoong Department Store Collapse in 1995. While the historical conditions that led to the disaster, such as the rapidly changing socioeconomic conditions and the disaster-based policy change model, are well-studied. However, there is a paucity of research examining the safety of the South Korean industry since. Our paper contends that any efforts made to reform the South Korean construction and development have long been ineffective since Sampoong, leading to still currently unsafe conditions. Ineffective government policy changes and the volatile construction industry have put public safety second and prioritized profits over people.

Introduction

Korean history throughout the 20th century is a testament to the poor conditions the Korean people faced by 1953. After decades of colonization by the Japanese, ending in 1945, the country was plunged back into war in 1950 between communist forces in the now North Korean region and the US forces that were stationed in the now South Korean region of the peninsula. Since then, South Korea has experienced an astonishing rapid and advanced development to the economic powerhouse that it is today. Korea increased its Gross National Product from 1.9 billion dollars to 451.7 billion dollars between 1960 and 1995 (Yee, 1998). Economics professor Marc Piazolo (2006) attributes the rapid growth of the economy to three main factors: the abundance of human capital, foreign investment, and the heavily export based trade strategy. Though these conditions would lead to problems of foreign indebtedness in the mid to late 90s, they also allowed a boost to the economy that was sustainable through Korean exports. Internally, the living conditions of average Koreans were changing rapidly. A strong export-based economy and developing manufacturing industry provided jobs to South Koreans with jobs that raised the standard of living. In 1995 South Korea, the economy never looked better, with exports soaring and the economic growth ever increasing (Lee, 2016). With globalization connecting industries and countries across the world, companies were rapidly growing, and South Korean infrastructure was ever developing.

However, this miraculously rapid growth came with an understandably inevitable price: under the name of expediency, lack of due diligence for the safety of the public. Though unbridled developments could lead on the surface to a better quality of life, plans motivated solely by short return on the investment would inevitably cause casualties. This basic but pervasive ethos of greed and indifference led to one of South Korea's and the world's most disastrous man-made accidents on June 29, 1995. The Sampoong Department Store, a luxurious department store in downtown Seoul, barely five years old, completely collapsed all of a sudden into rubble, killing 502 people who were

inside, injuring 937 others. Rescue efforts were chaotic and were only led under a unified authority after 5 days after the disaster (Gardener et al, 2002). Upon analysis in the aftermath of this event, there were countless red flags that pointed to this inevitable disaster. The Sampoong Group, the construction company responsible for the building, had been constantly cutting corners and approving designs and plans that had severe flaws. The Sampoong Disaster shone a harsh light to the deficiency of Korean society and the dangers it posed to the citizens. Our paper will first examine the event followed by examining the legal, structural, and economic causes of the disaster. Then, we will examine the thirty years after the Sampoong Department collapse and examine if any significant changes have been made in government policy or the related industries.

Sequence of Events

In the rapidly developing Seoul in the 1980's, the property developing company Sampoong Group led by Lee Joon decided to hire a construction company to build a building on top of a landfill in Gangnam, an area in downtown Seoul, in 1987. The building was meant for a 4-story office building, but Lee made several changes to the construction blueprint to add a restaurant gallery in a previously unplanned 5th floor. The officials and engineers rejected Lee's idea, declaring that his idea would damage the building and make it perilous. Lee disregarded all those who warned him of the dangers, and he continued with construction (Park, 2003; Yee, 1998). The department store opened in 1990 and quickly became a huge success attracting many customers. For the first five years of operation, profits were high, and the department store was successful. Then, in 1995, cracks started to form in the foundation due to the weak structure and the overload of unauthorized structures. However, no recourse was made to inspect nor fix any maintenance issues in the building. On June 29th, at around 5:00 PM, the uppermost floor sank. The floor was closed, but stores below remained open. Less than an hour later, at about 5:52 PM, the department store collapsed as the air conditioning units on the roof crashed through the building, the entire collapse lasting merely 20 seconds. The collapse trapped nearly 1500 people inside the department store, and rescue efforts were inefficient. It took nearly a day to clear the rubble in the hole and nearly 17 days for the last survivor to be found (Shin, 1995).

Causes of the Department Store Collapse

Engineering Flaws

There were deep flaws even in the planning stages of the Sampoong building. The construction company responsible for the building was Woosung Group, headed by Lee Joon. Instead of continuing with his original plan of building an office complex, Lee decided to use the same blueprints to construct a shopping mall instead. An additional fifth floor was added to be dedicated to a skating rink, adding a substantial weight that was not meant for the original plan (Dyrud, 2011). Engineers at Woosung refused to follow his order because they knew that switching the plan in the middle of construction would be impractical and unsafe. Lee, wanting to continue his plan despite the possible dangers, fired anyone who disagreed with him (Yee, 1998). After firing the initial construction company, he used his own building company to continue building his department store. Further, Lee decided to switch his plan again by adding 8 new restaurants to the top floor. This change meant that heating slabs, refrigeration units, and artificial ponds would be added, increasing the overall weight on the upper most floor by 35% (Dyrud, 2011).

Due to these additions, the design of the 5th floor differed tremendously from other floors. The concrete columns were too weak, and the steel informing rods that Lee used were thinner than what was required by the guidelines (Trosper, 2021). Lee, due to his extreme greed, wanted to maximize the space as much as possible, even if it meant to give up safety. He decreased the floor column thickness from 31 inches to 24 inches, and increased the space between each column to 36 feet in order to load more goods on each column (Almarwae, 2017). The escalators and fire shutters also required the reduction of support columns, weakening the overall building structure. Although Lee

tried to equalize the extra weight by installing 10-inch concrete floor slabs, they were not enough to compensate for the irregular space support. All these changes were against the regulations, but Lee bribed at least 25 inspectors and officials in order to open the store while breaking crucial building codes (Dyrud, 2011).

The final additions that were made were 45-ton air conditioning installments. They were extremely heavy, as they were over four times the weight the building design could handle, and were placed on the roof instead at ground level. The noise they made eventually resulted in resident complaints, which then Lee decided to move them to the opposite side of the roof. This process was done by just using pulleys and rollers to drag the ACs instead of utilizing cranes (Trosper, 2021). Therefore, a giant crack was formed on the roof, and the vibrations of ACs continued to increase this gap over time. When these cracks formed, Lee simply filled and covered them with paint. In the next few years, the vibrations from the units would widen the cracks that initially formed, further weakening the integrity of the building (Dyrud, 2011).

Cost-Cutting Measures and Lack of Maintenance

Even when clear signs of damage were present in April of 1995, Lee did not prioritize repairing or shutting down operations for public safety. After engineers demanded Lee to close the store after receiving calls of cracks forming throughout the structure, Lee refused and continued operations stating that he did not want to lose profit since "the number of customers in the building was unusually high" (Almarwae, 2017). The additional load from customers caused further damage to the building's structure and contributed to its ultimate collapse on June 29th.

Government Inefficiency and Corruption Plaguing South Korean Development

In advanced countries with proper regard for safety, building collapses and construction failures occur due to complex issues such as those in nuclear power plant leaks. In this sense, the Sampoong incident can be viewed as a problem within third world countries due to their "loose coordination and communication failure". Lee Joon's actions throughout the planning and construction of the Sampoong Department Store is indicative of the selfish attitude amongst developers and government officials during that time. Though conditions in South Korea were rapidly improving, the regard towards public safety was still very young. The fast modernization that occurred without transitioning smoothly from poor to advanced infrastructure created an "egocentric society" where people chose to "[compete] to privatize social rules and resources" (Yee, 1998).

Most buildings and structures were simple as there was almost no infrastructure existent in Korea in the 1960s. Due to their immense economic growth, South Korea began to focus on constructing buildings at a fast pace in order to get many projects done in time. This ideology is called "growth first, distribution later" which focuses on developing first (Dyrud, 2011). Prioritizing safety is also understandably costly; having plans approved and persistent safety checks are fairly heavy expenses, and for developers in Korea, the undeveloped land was a goldmine to capitalize on. Construction companies did not adhere to building standards and frequent bribes to local officials allowed for unsafe projects to be approved.

Not surprisingly, the Sampoong disaster was only the worst of a long line of disasters that occured in Korea due to lack of infrastructure and communication among government authorities. There were previous disasters that demonstrate that there were gross demonstrations of the failures of government and industry in considering the safety of innocent lives over company and personal profits. Incidents such as the Kup'o subway derailment, in which 78 lives were lost due to a miscommunication and coordination between construction subcontractors and the government, or the sinking of the Wido Ferry, in which 292 people drown in an overcrowded and overloaded boat, show that the symptoms of a corrupt society were already present before the Sampoong Department Store Collapse (Yee, 1998).

The Government's Response After Sampoong

Lee and his son were sentenced to 10.5 and 7 years, respectively, in prison, for their roles in the incident, while other officials involved were imprisoned and paid fines. Victims' families received a total compensation of $300 million, but the severe psychological damages were enduring (Dyrud, 2011). At the end of one year, about half of the survivors of the incident experienced post-traumatic stress disorder. The worsening mental health outcomes of survivors could be attributed to worsening health problems, delay in compensation, and a drastic change of their way of life (Kim, 2005). Many protests broke out by family members, claiming government response and compensation had not been enough.

In response to the public outcry and the severity of the disaster, the South Korean government initiated thorough inspections in many buildings in South Korea. Not surprisingly, only one in 50 were claimed to be safe (Marshall, 2015). Because of government inefficiency and corruption, the construction industry had been allowed to run with minimal supervision. The Disaster Control Act was finally passed on July 18, 1995, in order to strengthen the emergency response infrastructure within Korea. It was only October of 1995 that the national emergency medical services line, called the National 119 Rescue Service, was established to monitor national emergencies. Compared to other developed countries such as the US, South Korea's infrastructure was at its infant stages (Fay, 2019).

Along with other disasters caused by the same factors, a pattern of the Disaster-Triggered Policy Change model is evident in South Korea's government. This pattern occurs when the policy window (or when policy is likely to pass) for social change opens due to a great interest in the issue by the politicians, the public, the media, and experts. The greatest effect on policy change was ultimately by politicians as they communicate directly and can influence the public. To have a safe transition to an ultimately better and safer way of life, there should be strict requirements that will (Kim & Sohn, 2017).

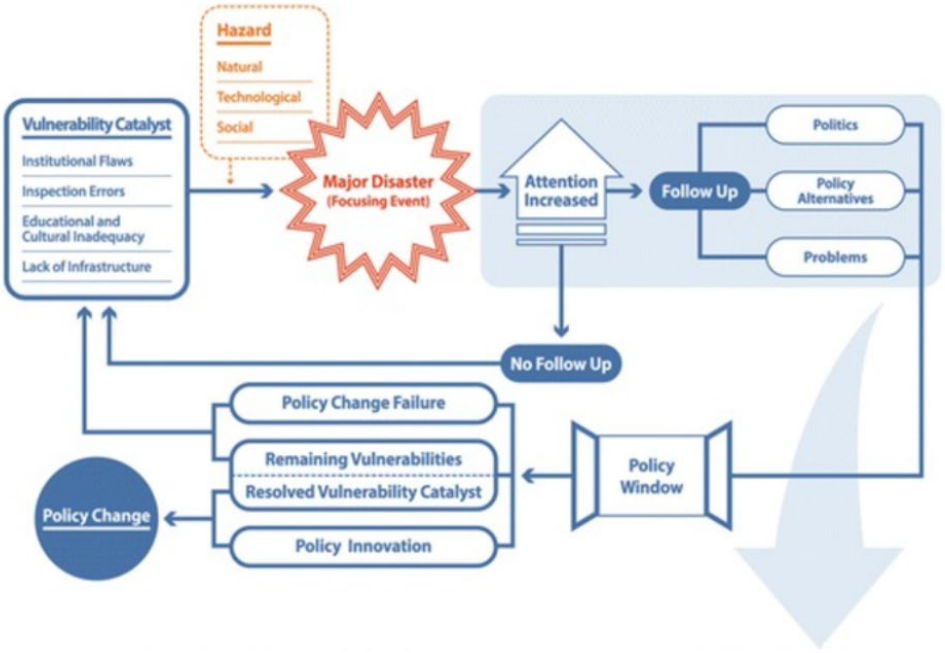

Figure 1. South Korea's Disaster-Triggered Policy Change model representing the pattern emerging from government and societal response to disasters. When a major disaster (Sampoong Department Store Collapse) occurs, the increased attention on the incident will affect politics, policy alternatives, and problem stream. If the government takes action within the policy window, then policy change will be successful. If there is a failure to change policy, then the system is vulnerable to more major disasters (Kim & Sohn, 2017).

The Building Sector since Sampoong

Since Sampoong, the building sector, which includes construction and development, has gone a tumultuous path. The greatest obstacle in reform in the building sector is the overall corruption that was a holdover from South Korea's authoritarian regimes, which ended with the fair and democratic election of President Roh Tae-Woo in 1987. Though Korea's transfer to democracy was relatively smooth, the cultural and structural changes were slow to come. Though government policies have been passed to combat government corruption, there are still many corruption scandals that plague the construction industry.

In the most famous scandal, South Korean President Lee Myung-Park initiated the Four Rivers Restoration Project in 2009. The infamous infrastructure and construction project cost 22 trillion won ($20 billion USD) and would restore the Han River running through Seoul and make it accessible to the public. The river bed would be deepened and structures such as dams and walls were built to control the water flow and use it for drinking water and prevent floods. However, President Lee was soon under investigation for corruption due to prosecutors suspicious about the project's goals. It was revealed that 18 construction companies were making corrupt deals with government officials and President Lee, which led to the 111.5 billion won fine by the Fair Trade Commission (Kalinowski, 2016). After the project's completion, numerous audits showed that poor design by the construction companies have weakened the dams used to control water flow of the river. However, the government under President Park Geun Hae, after Lee Myung Park, did not investigate or bother to reform the issue further (Ryu, 2018). Though the audits are an improved response to corruption in South Korea, the pervasiveness of corruption within the highest offices of South Korean society is worrying.

Today, the construction industry is unstable, increasing the possibility that safety concerns will be considered secondary. When the Korea Institute of Civil Engineering and Building Technology ranked the competitiveness of the Korean construction industry against other foreign markets, it had fallen from 10th place before 2019 down to 12th place. Due to the competitiveness of other foreign markets and the lack of innovation, the Korean construction industry has shown little improvement over the years (GCR Staff, 2019). Still residential buildings dominate the building sector and demand for new buildings is substantial (Benghida, 2017). Another worrying aspect of the construction industry is the presence of corruption. In a 2020 analysis of corruption in the construction industry, the main causes were attributed to similar problems in Korea's past. A lack of transparency, nepotism, and bribery was still evident within the industry with policy measures being minimally effective in preventing unethical behavior (Sung, 2014).

Public Safety of Structures and South Korea Today

Currently, South Korea is still a young democracy and issues of public safety concerns are still prevalent within the South Korean construction industry. Most analysis on the South Korean construction industry is concerned with its competitiveness or economic effects on South Korea (You & Zi, 2007; Choi et al, 2013; Benghida, 2017). Safety standards of buildings and construction sites have been improved throughout the past few decades, but not enough analysis has been done to identify current bad actors and devise proactive solutions instead of reacting to major disasters after many lives have been taken. In one analysis of the safety of construction sites, the main causes of a dangerous worksite was due to lack of management by the construction companies overseeing the workers (Park et al, 2020). Developers and construction companies are cutting corners that have led to numerous construction incidents just in the past decade.

In September of 2018, the Sangdo Kindergarten building in Dongjak-Gu in Seoul collapsed after gross negligence on the part of the construction company. Months before the collapse, school staff noticed that the 3-floor kindergarten building tilted about 10 degrees vertical and there were cracks along the building walls. Next door, a construction company had been building a new apartment complex and construction operations had been slowly weakening the Sangdo Kindergarten building. Even when school teachers, administrators, and civil engineers had warned

the company of the dangers, they simply ignored the warnings and resumed. Civil engineers stated that the "unsafe excavation work" performed by the nearby construction site resulted in the collapse. Further, Cho Hee-Yeon, the head of Seoul Metropolitan Office of Education, claimed that the main cause of the disaster was "lax construction regulation laws." He believes that construction laws must be revised as it is very dangerous to start construction right near a preschool. If the collapse had begun in the morning, the lives of 120 children would have been at risk (Lee, 2018).

In January of 2021, the construction company Hyundai Development Co. (HDC) had been underway in the demolition of a building in Gwangju. The authorized demolition collapsed the building and collapsed on a bus, killing nine passengers (The Strait Times, 2021). HDC had subcontracted the process to a medium-sized construction company, which in turn subcontracted the demolition to another small company. These companies didn't follow the excavation work standards to save on expenses and performed work that damaged the integrity of the ground that the building stood on (Yonhap Staff, 2021). Again, corruption throughout all levels of planning had caused preventable deaths of innocent civilians.

In January of 2022, 394 construction workers in Gwangju were working on building a small apartment complex headed by the same company, HDC, that caused the construction site accident the previous year. Suddenly, the building's structure collapsed as the exterior wall crumbled, injuring the workers and killing one. Upon investigation, HDC was found to have already committed several infractions for the construction practices and received administrative penalties. After the incident, the government ordered all constructions by HDC in the country to stop. Further, President Moon Jae-In ordered the government officials to thoroughly inspect all construction sites in South Korea, influencing other major cities such as Busan, Daegu, Cheongju, and Daejeon to follow (Yoon, 2022). Though the government response is certainly an improvement, these statements have been mainly hollow, failing to strike heart at corruption in major developers and construction companies.

These instances show that although South Korea has undergone constant development with infrastructure improving every decade, it still is prone to accidents that have been caused by selfish entities with no regard for public safety.

Conclusion

Government corruption and the building sector's negligence in South Korea's history led to the tragic Sampoong Department Store collapse. The latest incident is merely indicative of a larger systemic issue in which public safety had been repeatedly disregarded for the sake of revenue. A pattern of Disaster-Triggered Policy Model is evident throughout South Korea's history. Since then, there has been a greater effort to root out corruption and improve South Korea's construction standards. However, due to South Korea's deep roots in authoritarian regimes and the government's own corruption, it has been difficult to effectively catch bad actors. The most important but most difficult step to alleviate this problem is to establish transparency and reform within the government. The Anti-Corruption Act and the Public Services Act was established to better monitor the actions of corrupt officials and those with personal interests in politics. However, there are far too many cases that show that these laws were not effective. These laws must be revised and strengthened to pressure politicians to discourage other criminals and display more transparency to the public. An independent organization should be set up to examine abuses specifically for approved contracts and specific officials and punishments for government officials and company owners who violate the law should be harsher. The South Korean government and building sector must evaluate itself.

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