

Chang Yong Rhee: Sustainability challenges in Korea

Keynote speech by Mr Chang Yong Rhee, Governor of the Bank of Korea, at the Global Engagement & Empowerment Forum 2025 on Sustainable Development "Time for Action: Bridging Divides for a Sustainable Future", organised by the Yonsei University, Seoul, 14 March 2025.

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I. Introduction

Ladies and gentlemen, distinguished guests, I am Rhee Changyong, Governor of the Bank of Korea.

It is an honor to join the Global Engagement & Empowerment Forum (GEEF) to discuss building a sustainable future. I sincerely thank Yonsei University President Yun Dongseob, former U.N. Secretary-General Ban Ki-moon, and everyone who made this event possible. I am also pleased to reconnect with former World Bank President Jim Yong Kim after my time in Washington, D.C.

Over the years, the GEEF has brought together global leaders, international organizations, businesses, and stakeholders to explore solutions for achieving the United Nations' Sustainable Development Goals (SDGs). I hope this forum continues driving practical solutions to today's sustainability challenges.

I am here to share Korea's perspective on these issues. Some people say, "The Governor of the Bank of Korea is overstepping his bounds," because I speak on social issues beyond monetary policy. Discussing the SDGs today may reinforce that perception. While central bankers debate their role in such discussions, sustainability challenges directly impact our economy and daily lives. For this reason, I cannot remain indifferent-not just as a central bank governor, but also as a citizen.

Sustainability takes many forms, but today I will focus on two urgent challenges for Korea's economy. The first is climate change, a global crisis affecting everyone. The second is our declining birth rate and aging population, a challenge that is especially severe in Korea.

II. Climate Change

There is global and domestic consensus that human activities drive global warming and reducing carbon emissions is essential. However, Korea faces significant resistance to accelerating carbon reduction due to its heavily export-oriented economy dominated by high-carbon manufacturing industries. Strengthening emission reduction policies and environmental regulations raises concerns about export companies losing competitiveness. Thus, balancing urgent carbon reduction with sustaining industrial competitiveness has become a central issue.

However, climate change should not be viewed solely from the perspective of export industries. It is a crisis directly affecting our daily lives and quality of life. We are already

experiencing more extreme heat waves, frequent flooding, and the gradual disappearance of familiar fruits and vegetables. Our summer rainfalls used to be predictable, but not anymore. If Los Angeles can experience massive wildfires, what is stopping Korea from experiencing similar disasters? Climate change is not distant-it is occurring now, and its impacts are unavoidable.

Air quality is a clear example. Last week, I visited Cape Town, South Africa, for a BIS meeting. While it was winter in Korea, it was summer there, with warm weather, a refreshing sea breeze, and remarkably clean air. Within days, I realized, "This is truly clean air." Upon returning to Incheon Airport, I immediately felt a headache-not just from the flood of emails about economic and political concerns, but also from the noticeably poorer air quality. Korea's air quality has improved recently, but after experiencing cleaner air in Washington, D.C., I can clearly sense the difference. As someone sensitive to lung health after experiencing long COVID, this difference is especially noticeable. Although conditions have improved, fine dust remains a serious issue.

Statistically, the cost of deteriorating air quality is undeniable. Over the past 15 years, diagnoses of atopic dermatitis and allergic rhinitis have doubled, and cases of heat exhaustion have quadrupled, now totaling 4,000. Climate change directly threatens our health, making the challenges of protecting public health increasingly severe as temperatures rise and pollution worsens.

Another example is the increased frequency of sudden downpours, repeatedly flooding Seoul's Gangnam Station area, one of Korea's wealthiest neighborhoods, submerging numerous luxury vehicles over the past several years. Beyond property damage, the human toll has been devastating. Just two years ago, 14 people tragically lost their lives when an underpass collapsed after 500mm of rain fell in thirteen days. Observing these intense summer storms reminds me of tropical squalls typically seen in Thailand or South America.

The Korea Meteorological Administration now classifies rainfall exceeding 50mm per hour or 90mm over three hours as "extreme heavy rain," conditions responsible for 80% of flood damage. These extreme events have more than doubled since the 1970s. Given these dramatic changes, it is unclear whether our current flood prevention infrastructure-such as dams, embankments, and drainage systems-can handle the intensifying conditions. About 20% of national river embankments are already rated as "inadequate" or "poor," and projections suggest half of Korea's dams may fail to prevent flooding by 2040. We must proactively strengthen infrastructure now to withstand growing climate challenges.

Third, climate change is disrupting our food supply. Last year, I faced criticism from agricultural stakeholders after suggesting apple imports due to soaring prices (Im et al., 2024). Initially, I anticipated resistance primarily from traditional apple-growing regions like Daegu and North Gyeongsang Province. However, apple production areas are gradually shifting northward. Apple cultivation in Daegu-Gyeongbuk has decreased by nearly half compared to 30 years ago. Once grown nationwide, except for the southern coast and Jeju Island, projections suggest high-quality apples will only be viable in

Gangwon Province's mountainous areas by the 2030s, due to rapid climate change (Rural Development Administration, 2022). Within a decade, importing apples will likely become a necessity rather than controversial.

The fishing industry faces similar disruptions. Pollack, once a staple in Korea, has nearly vanished from local waters, with catches below one ton since 2019. Traditional species like croaker and anchovies are declining, while warmer-water species like yellowtail and mackerel are increasing. Korea's fishing industry must rapidly adapt by modernizing vessels, gear, and aquaculture techniques to match the changing marine ecosystem.

While countless examples exist, the core message is clear. Climate change is not just a challenge for export industries-it already deeply impacts our daily lives and various domestic sectors. Thus, addressing climate change and reducing carbon emissions is not a matter of choice-it is an urgent necessity.

Although the government has initiated policy efforts, substantial progress remains necessary. First, Korea's Green Taxonomy (K-Taxonomy) must align with international standards to clearly define "environmentally friendly" activities, signaling strong support for carbon reduction. Second, carbon pricing must be more realistic. Last April, the global average carbon price was approximately \$30 per ton, reaching \$60 per ton in the EU, compared to only \$6 per ton in Korea. At this price, companies find it more economical to buy emission credits than reduce emissions, undermining carbon reduction targets. Third, structural improvements to Korea's Emissions Trading System (K-ETS) are needed. Gradually reducing the 90% free allocation rate and tightening the emissions cap will create stronger market incentives for effective emissions trading.

The Bank of Korea is also increasing its efforts by conducting financial stress tests on climate-related risks. Financial institutions traditionally manage risks like loan defaults and real estate fluctuations, but climate-driven risks introduce unexpected tail risks not yet fully considered. Events like Los Angeles' wildfires or Australia's six-month wildfire crisis in 2019 are not distant threats. They serve as warnings for Korea. Severe localized climate damage could cause significant financial losses for households and businesses, destabilizing financial institutions and spreading shocks throughout the economy.

Thus, the Bank of Korea actively researches climate risks' impacts on our industries and financial system, conducting stress tests with financial institutions under various scenarios. Next Tuesday, we will present these climate stress test results at a joint conference with the Financial Supervisory Service.

Bank of Korea employees are also committed to reducing carbon emissions through research (Kim et al., 2024) and daily practices. Believing even small actions matter, we have adopted eco-friendly measures such as using recycled-paper business cards, reducing plastic use, turning off unused lights, and implementing license plate-based driving restrictions.

III. Ultra Low Fertility and an Aging Population

Beyond climate change, one of the most pressing sustainability challenges is our demographic crisis—an aging population combined with extremely low fertility rates. Korea's total fertility rate slightly rose to 0.75 in 2024 from 0.72 in 2023. Although this small uptick is welcome, a fertility rate of 0.75 remains a national emergency. If this trend continues, Korea faces an irreversible population crisis that threatens economic stability and social cohesion.

Some people suggest that population decline might have benefits, such as reduced pollution, lower energy consumption, and higher GDP per capita, possibly enhancing quality of life. However, this view dangerously oversimplifies the issue. A fertility rate of 0.75 leads not to gradual decline but rapid demographic collapse, undermining economic and social stability. By contrast, the OECD average fertility rate of 1.4 results in a more manageable and sustainable population decline.

The difference between fertility rates of 0.75 and 1.4 significantly impacts economic growth prospects. At 0.75, Korea's population would shrink from 51.7 million to 30 million in 50 years, just 58% of today's figure, declining annually by 1.1%. In contrast, at a rate of 1.4, the population decline is less severe, reaching 43 million—83% of today's level—with an annual drop of 0.4%. From a purely demographic standpoint, the difference in GDP growth between these two scenarios would amount to 0.4 percentage points annually. But the true cost goes beyond this simple calculation. A declining youth population, crucial for innovation, entrepreneurship, and economic dynamism, would severely undermine Korea's long-term growth potential. According to a recent Bank of Korea study, Korea's potential growth rate, currently around 2%, may approach near 0% by the late 2040s (Lee et al., 2024). If the fertility rate remains at 0.75, Korea will inevitably face prolonged negative economic growth after 2050. Conversely, at 1.4, Korea could maintain positive economic growth well into the future.

Beyond GDP, persistently low fertility will create substantial fiscal strain, increasing the burden on younger generations. As the elderly population surges, spending on pensions, healthcare, and elder care will rise significantly. According to the National Assembly Budget Office (2025), Korea's national debt-to-GDP ratio, currently 46.9%, is projected to reach 182% within 50 years if fertility remains at 0.75. If fertility improves to 1.4, the ratio would increase more slowly, reaching 163%. The burden on young Koreans will become particularly overwhelming. Currently, four working-age individuals support each elderly person. At a fertility rate of 0.75, this ratio will decline to one-to-one within 50 years. At 1.4, however, it remains more manageable, easing strain on future generations.

Moreover, economic instability from demographic shifts increases society's vulnerability to populism. Stagnant growth exacerbates income inequality, deepens generational and class divides, and fuels political polarization. Politicians and governments may resort to populist fiscal policies, such as direct cash handouts and temporary welfare measures, providing short-term relief without addressing underlying issues. Such policies risk creating a cycle of fiscal inefficiency and mounting national debt, exacerbating rather than resolving the core problems.

To preserve economic sustainability, decisive action must be taken urgently. If Korea's fertility rate remains critically low without significant expansion of the workforce through

foreign labor, the country risks chronic negative growth, soaring debt, and escalating social tensions. Avoiding this scenario requires raising the fertility rate to a more viable level. Completely reversing population decline may be unrealistic since many advanced economies face similar demographic challenges, but Korea cannot afford to remain passive. At a minimum, we must strive to reach the OECD average fertility rate of 1.4.

Why has Korea's fertility rate fallen so drastically? The answer lies in structural barriers discouraging young people from marriage and parenthood. Bank of Korea studies indicate young Koreans delay or forgo marriage and childbirth due to intense competition and anxieties over employment, housing, and childcare. Young people today face fierce competition for scarce, high-quality jobs, making career stability difficult. Simultaneously, soaring housing prices make homeownership seem unattainable. Under these pressures, raising children is more than challenging—it is an overwhelming financial and emotional burden.

A major driver of this crisis is the extreme concentration of population and economic activity in the Seoul metropolitan area. A recent Bank of Korea study analyzing fertility trends in 35 OECD countries identified Korea's urban concentration as among the highest globally, pinpointing it as a key factor behind the country's ultra-low fertility (Hwang et al., 2023). Over 50% of Korea's GDP, population, and jobs are concentrated in the Seoul metropolitan area—much higher than 5% in the U.S. and Germany, 10-20% in the U.K. and Italy, 20-30% in France, and 30% in Japan. While Korea's rapid economic development—the "Miracle on the Han River"—transformed the country into an economic powerhouse, it also centralized infrastructure, talent, and opportunities in Seoul. Consequently, young people continue migrating to the capital for career prospects, draining vitality from regional economies and pushing many toward demographic extinction.

Korea's highly competitive university entrance system further reinforces the population concentration in the Seoul metropolitan area. Admission to prestigious universities is considered essential—not only for stable employment but also for social status and marriage prospects. This fuels intense competition for limited spots at elite universities, overwhelmingly located in Seoul. Private education has become critical, prompting families to relocate to Seoul's affluent areas like Gangnam-gu, known for high-quality private educational infrastructure. Many parents unable to afford homeownership instead rely on costly rental housing to secure educational advantages. This strategy appears justified, as students from Seoul account for 32% of admissions to Seoul National University (SNU), despite representing only 16% of school-age population. More strikingly, students from Gangnam-gu alone constitute 12% of SNU admissions, three times the district's 4% share of school-age residents (Chung et al., 2024). Relocating to Gangnam-gu is thus seen as essential for top university admission, intensifying Seoul's population density, raising housing prices, and worsening the fertility crisis.

Korea's university admission system is excessively competitive by any standard. Parents sacrifice their quality of life and retirement savings, investing considerable resources to secure their children's admission to elite universities. Paradoxically, this intense pursuit of academic success imposes a heavy cost on both parents and children. From as early as kindergarten, students experience relentless pressure and burnout, depriving them of childhood joys and a healthy adolescence.

Korea's critically low fertility rate (0.75), extreme population concentration in the Seoul metropolitan area, and overheated university competition seem like separate issues but are deeply interconnected. Left unresolved, these challenges—drastic population decline, persistent negative economic growth, escalating social tensions, and diminishing opportunities for youth—will push Korea toward an unsustainable tipping point. Addressing these structural issues simultaneously is challenging, yet the urgency demands bold action. Recognizing this, the Bank of Korea recently proposed two policy suggestions: foster a limited number of regional hub cities and implement a "regional proportional admission system" for universities.

First, to effectively reduce the extreme population concentration in the Seoul metropolitan area, we must strategically develop a small number of regional hub cities. Over the past two decades, regional development policies have been introduced to address this imbalance. However, due to political challenges and efforts to evenly distribute resources nationwide, these initiatives have been too fragmented to meaningfully curb Seoul's dominance.

According to Bank of Korea research, the optimal approach—given Korea's land area and population—is to concentrate substantial investments in two to six carefully selected regional hub cities. Targeted, large-scale investment in critical infrastructure, such as healthcare, education, and cultural amenities, is essential to providing a quality of life comparable to Seoul, thus effectively attracting and retaining residents (Chung et al., 2023, 2024). Pursuing this focused strategy will rebalance population distribution, revitalize regional economies—including surrounding smaller cities—and achieve sustainable national development.

In parallel, bold reforms to Korea's college admissions system are essential. The Bank of Korea has proposed a "regional proportional admission system," where universities voluntarily allocate admissions based on each region's proportion of high school seniors (Chung et al., 2024). Despite multiple revisions to university entrance system, excessive competition in university admissions remains unresolved. BOK's new proposal seeks to enhance universities' autonomy in admissions while strongly requiring balanced regional representation—a crucial step to address extreme competition. Adopting this system offers several benefits. First, it reduces the disproportionate influence of socioeconomic factors such as parental wealth and private education, thus significantly enhancing social mobility. Second, dispersing admissions competition from Seoul would ease demographic pressures, stabilize housing prices, and improve fertility rates. Third, attracting students from diverse regions promotes mutual understanding, social cohesion, and reduces regional disparities.

This proposal does not require government intervention or legal amendments, relying instead on the willingness and initiative of leading universities. In Korea, there remains a strong belief that selecting students based solely on academic scores is the fairest, leading resistance to this proposal. Some universities argue they already implement regional proportional admissions for roughly 15% of their freshmen. However, such limited quotas can stigmatize these students and have insufficient impact on demographic or housing pressures in Seoul. To be effective, regional proportional admissions must be applied to most incoming students' admissions. In many advanced nations, regional diversity in admissions is widely accepted and encouraged. I believe Dr. Jim Yong Kim, joining us today and a former president of Dartmouth College,

understands this issue well. He could highlight how Korea's test score-based admissions approach is an exception globally, and how this reform could realistically occur through proactive leadership at major universities.

In my view, allowing universities greater flexibility in evaluating applicants-under regional proportional requirements-would better acknowledge and fairly recognize diverse talents. Human talent is far too diverse to be measured by academic tests alone. Yet, Korea's current admissions system prioritizes a narrow skillset: memorization, quick mathematical calculations, and rapid text summarization under time pressure. These skills, overly rewarded by standardized exams, limit the range of recognized talents. I happen to possess these particular skills and was a major beneficiary of Korea's college admission system. However, if asked to write a creative essay over a week, I might not have excelled. Today, elite university students often share certain defining characteristics such as a personality that diligently follows instructions without rebellion, a willingness to endure 15 years of repetitive study from kindergarten, an IQ high enough to handle the academic workload, but not so high as to question or challenge its purpose.

When Korea's primary goal was catching up with more advanced nations, the current educational system was beneficial in developing individuals who excelled at following orders and carrying out assigned tasks. However, with Korea now at the forefront of global technological competition, we need people unafraid to explore new frontiers, bringing diverse backgrounds and innovative thinking. Additionally, we must foster an environment that encourages collaboration, creativity, and meaningful interaction. It is time for universities to broaden their evaluation criteria and nurture diverse talents by implementing regional proportional admissions.

The challenges highlighted today-climate change and demographic crisis-pose critical threats and require urgent action. Korea has achieved remarkable economic progress, joining the ranks of advanced nations. Now we must focus on enhancing individual well-being, ensuring prosperity and happiness for all citizens. Through bold decisions, we can develop vibrant, youth-friendly, green regional hubs that combat climate change and support marriage and childbirth. The Bank of Korea remains fully committed to securing a sustainable, prosperous future for upcoming generations.

Thank you for your time and attention.

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