Many of Asia’s great cities are coastal, which places them squarely in the path of rising sea levels as global temperatures continue to rise. If efforts aren’t stepped up to mitigate the impact of climate change on these urban areas, the question isn’t whether they will be flooded, but when. John Feffer examines the feeble efforts to grapple with this growing threat.
Asia is particularly vulnerable as the water threat comes from the ocean and the sky.

Each degree of increase in global temperatures translates into a little more than a two-meter increase in ocean levels. Some cities in Asia, such as Bangladesh’s capital, Dhaka, have already been inundated by flooding. Shanghai has built 520 kilometers of sea walls to protect against the rising tide. Jakarta is especially at risk because, even as the water levels are rising, the Indonesian capital is sinking from more and more residents draining the fresh water from beneath the city. In the worst-case scenario of a 65-meter rise in the oceans — which would result from a melting of the polar ice caps — Mumbai, Bangkok, Manila, and Beijing would all go under the waves. It’s not just cities, of course. Rising ocean levels also have a direct impact on agriculture. The intrusion of salt water through deltas into rivers and streams can destroy the livelihood of millions of farmers and threaten the food security of entire regions.

Asia is particularly vulnerable because the water threat comes from two directions: from the ocean and from the sky. Kim Hyungjin studies water systems at the APEC Climate Center in Busan. Each degree Celsius increase in temperature, he has told me, boosts the amount of water vapor in the air. That translates into more rainfall. But here’s the catch: it’s not evenly distributed. It’s a “rich getting richer” pattern, he says. “We have a global monsoon area. This area has more precipitation than others. When there is a monsoon area, there is a dry area outside of the monsoon area. There is circulation to maintain balance. The monsoon area, which has more rain than others, has even more rain than before. The dry area, which gets less rain usually, gets drier.” That’s bad news for Asia, much of which is sub-tropical and already bears out this pattern. As Kim points out, “rainfall for areas that already experience flooding increases by 7 percent for every degree of increase in global temperatures,” he says.

Released in 2009, South Korea’s first major disaster film depicts what happens when a massive tsunami hits Busan’s expensive beachfront, killing hundreds of thousands of people.

Both the film (explicitly) and the aquarium (unwittingly) send an ominous message. If the international community fails to arrest rising global temperatures and cities such as Busan don’t take firmer measures to protect against the ocean waves, then these simulations of being underwater will become the reality for Haeundae.

Busan’s beachfront is particularly vulnerable to typhoons, having experienced flooding in 2003, 2010, and 2012. But Haeundae Beach really felt the power of the ocean in late September 2016, when Typhoon Chaba struck South Korea’s southern coast. Waves up to eight meters high slammed into apartment buildings, hotels, and restaurants, causing considerable damage.

Busan could have avoided at least some of that damage. In 2012, the municipality attempted to build a 3.4-meter barrier above the existing 5.1-meter breakwater. When restaurant owners and residents complained that the addition would block their oceanfront view, the city scaled back its project to 1.2 meters. The waves from Typhoon Chaba easily overwhelmed that obstacle.

The Vulnerability of Asia

Busan is by no means the most vulnerable of Asia’s port cities. According to a survey by Climate Central of the impact of a 3-degree increase in global temperatures, Asia would be hit harder than any other region in the world, with four out of every five inhabitants directly affected by the changes. Swathes of Osaka, Shanghai and Hong Kong would simply disappear.

A Tale of Two Cities

In 2016, South Korea led the Climate Action Tracker’s list of worst offenders. To be sure, the government talked a good game on reducing carbon emissions and also hosted both the Green Climate Fund and the Global Green Growth Initiative. On the other hand, it has been increasing its per-capita emissions, and renewable energy contributes a mere 1 percent to the country’s energy needs. To add insult to injury, South Korea lessened its commitment to meeting its Paris climate agreement obligations, already rather modest, by giving itself an additional decade to meet the goal. In its effort to get South Korea off that list, the new government of President Moon Jae-in has pledged to shut down 10 coal-fired power plants and build no new ones. The government has also set an ambitious goal of renewable energy contributing 20 percent to the overall total by 2030. Still, the country continues to get a “highly insufficient” grade from Climate Action Tracker.

Things are somewhat different on a municipal level. For the past few years, Seoul Mayor Park Won-soon has pushed ahead aggressively with a sustainable energy plan for the city that relies on greater use of renewable energy, particularly solar, and more civic involvement in energy conservation. Since Seoul accounts for a large portion of South Korea’s population, these municipal efforts have a national impact. The port city of Busan is more exposed than Seoul to the immediate impact of rising waters. “We do recognize that we need a structural change,” Lee Geun-hee, the director general of the city’s Climate and Environment Bureau, told me. “We do have rising sea levels. We have too much rain at the same time. Busan and Korea used to have a

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1 www.theguardian.com/cities/interactive/2017/nov/03/three-degree-world-cities-drowned-global-warming
4 www.climatetechnews.com/2016/11/04/south_korea_climate_villains/
6 http://climatesolutiontracker.org/countries/south-korea.html
7 www.huffingtonpost.com/park-wonsoon/seoul-climate-change_b_5855920.html
At some point, China and the region must adapt to the reality of the ever-rising tide. Ular amounts of rain during the monsoon season. But the amount of rain has increased dramatically. We built facilities, like waste-treatment facilities, based on these 30-year expectations. To address these changes, Busan has retro-fitted some of its existing structures to deal with the problem, such as by creating additional drainage infrastructure beneath the city to handle all the additional water. Busan is also creating Eco Delta City, which will occupy what had been a largely other environmental concerns such as sustainable energy production. Like Busan, Kitakyushu faces the double threat of the ocean and monsoon rains, and it is constantly at risk of flooding. It has also built sea walls that seem woefully inadequate to the challenge. And, like Busan, the presence of nearby mountains seems to provide false reassurance. You’d think that after 2011, and the tsunami that caused the near meltdown at the nuclear plant in Fukushima, Japanese cities would have switched into high gear to protect their coastal lines. But Okamoto Shinichi, who works on environmental concerns in the Kitakyushu city government, didn’t seem excessively concerned. “The coastal area of Kitakyushu is about 200 kilometers,” he told me. “Right now, it may be not the best idea to protect the whole area with a wall. It’s not something you can build in a day. Instead, right now, we’re monitoring areas sensitive to the problem and addressing them.” He didn’t seem aware that Shanghai was building a sea wall to protect a coast twice that length. Okamoto was once responsible for water problems. “I can tell how much effort is made to try to deal with an eventual tsunami or flood in the best way possible,” he told me. And that largely consists of alerting the population. “You can see on every light pole the elevation of the area,” he added. “If there is an area in danger of flooding, people know about it and they can leave the area and go to a higher area.”

At the national level, Japan has generally responded more resolutely to the threat of climate change than South Korea has. After the Fukushima nuclear disaster in 2011, the share of renewable energy in Japan’s overall electricity generation jumped from under 10 percent to nearly 15 percent in only five years. Still, the same organization that singled out South Korea for its inadequate response puts Japan in the “highly insufficient” category as well. Worse, Japanese cities seem to be stuck in discussion mode — even Osaka, a much larger and more exposed city than Kitakyushu. “In the past our response was focused on reducing the causes of global warming, but given that climate change is inevitable, we have even started talking about a Green Belt and Road. Well, it’s not quite there yet. That’s the challenge: They’re often greener in investing in China than going outward.”

Key to greening the One Belt, One Road Initiative is financing. Last year, China issued a US$2.15 billion green bond to finance renewable energy-related projects associated with the initiative. At the level of ports, the focus to date has generally been on the reduction of pollution and carbon footprints, rather than adaptation to empty flat area in the western quadrant of the city. The new zone will feature new residential and business districts but also a new airport and a new port. “We can expect that the frequency of rain and amount of rain will be much greater, so we have made the ground three meters higher,” Lee told me. In addition to pumps on the nearby river to deal with potential overflow, it will feature other “eco” elements, such as a greater reliance on sustainable energy. Although he acknowledged the importance of building larger sea walls to contain the rising ocean, Lee pointed to a geographic feature that advantages Busan: the city is surrounded by mountains. But however high those mountains, the low-lying areas of Busan, like Eco Delta City and the Haeundae beachfront, remain vulnerable. And the city doesn’t seem to be moving with any great urgency in the direction of climate adaptation.

A three-hour ferry trip separates Busan from the Japanese prefecture of Fukuoka. Perched on the northern coast of the prefecture, Kitakyushu is well known for its environmental record over recent decades. In 1997, the city began promoting its “Eco-Town Project” focused on comprehensive recycling at home and in industry. In 2002, the city expanded the program to include adaptation to the reality of the ever-rising tide.