Green Special Economic Zones (SEZs):
Can Indonesia Promote Sustainable Growth Through SEZs?

In 2015, the United Nations (UN) presented its Sustainable Development Goals as a universal blueprint for the world to address pressing global challenges, which include issues such as economic inequality, environmental degradation, and climate change. However, global progress on these issues has been set back by factors that introduced a protracted period of global economic slowdown and threatened global economic stability, from the COVID-19 pandemic to Russia's invasion of Ukraine. If anything, these global events served as a reminder of an ever-increasing urgency and importance of achieving the goals of resilient and sustainable economic development. This is especially the case as governments were scrambling to regain lost ground to compensate for lost time and opportunities.[1]

The Indonesian government is no exception, recognising the pressing need to achieve its slated sustainable development goals. In his remarks at the 2021 Partnering for Green Growth and the Global Goals 2030 (P4G) Summit held in South Korea, President Joko Widodo said that "extraordinary measures" must be taken to ensure economic development is achieved sustainably. President Widodo emphasised the importance of creating "an enabling environment that encourages synergy between investment and job creation with green development."[2] To this end, special economic zones (SEZs) across Indonesia now play a crucial role in the government's push to create such an environment and usher in an era of green and sustainable economic growth.

However, there exists an inherent tension between economic development and environmental protection. According to the Environment Kuznets Curve which postulates that pollution and income per capita levels share an inverted U-shaped relationship[3], environmental degradation is greater in the initial stages of economic development where growth is prioritised over environmental protection. It is only after per capita incomes increase to a sufficiently elevated level that greater attention would be given to preserving and protecting the quality of the environment. Such an inverted U-shaped relationship implies an inevitable trade-off between pursuing economic development and environmental protection.

For Indonesia, which is home to both one of the world's fastest developing economies and some of the most biodiverse regions on the planet, this raises the following problem: can Indonesia successfully tap into its massive economic growth potential without compromising its natural environment? A key regulatory challenge of green SEZs in Indonesia would be to sustain industrial

[1] Katrin Eggenberger, "Has the UN reached its sustainable development goals? Yes and no," WEF, November 10, 2022, https://www.weforum.org/agenda/2022/11/the-un-sustainable-development-goals-a-positive-perspective/.
[2] "Indonesia Committed to Inclusive, Sustainable Development: President Jokowi," Office of Assistant to Deputy Cabinet Secretary for State Documents & Translation, accessed December 10, 2022, https://setkab.go.id/en/indonesia-committed-to-inclusive-sustainable-development-president-jokowi/.
[3] Soumyananda Dinda, "Environmental Kuznets Curve Hypothesis: A Survey," *Ecological Economics* 49 (2004): 432, https://doi.org/10.1016/j.ecolecon.2004.02.011.

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development without incurring much environmental cost. In response to this dilemma, Indonesia is attempting to integrate environmental sustainability into its SEZ strategy to reconcile these seemingly opposing goals.[4]

This case study will evaluate the sustainability of Indonesia's SEZ strategy. First, the case study will trace the background of Indonesia's challenges in economic development and how their adopted SEZ strategies has addressed them. After this, a survey of the strategy's environmental impacts and causes will be presented. This will be followed by an analysis of potential measures that the Indonesian government can adopt to mitigate the negative environmental impacts of SEZs and achieve its sustainable economic development goals. In the concluding section, this case study will examine and evaluate the Indonesian government's current policies to address its environmental problems.

Indonesia's SEZ Strategy to Promote Economic Development

One key feature of Indonesia's economy is the sharp economic inequality between the country's central and peripheral regions. The origins of the variation in the levels of economic development could be traced back to the Dutch colonial period when the Dutch pursued an uneven economic development strategy. As a result, economic activity in the country today is far more concentrated in the central island of Java.[5] This history of uneven economic development could also be attributed to Indonesia's archipelagic geography, which has played a significant role in shaping the country's spatial patterns of economic activity. Indonesia's fractured geography imposes substantial internal trade costs for firms and businesses located away from economic activity centres.[6] The huge regional differences in income and economic activity also posed a direct and significant threat to national unity, especially for a country home to over 1,000 different ethnic groups.[7] In particular, the centralisation of economic activity in Java has contributed to sentiments of the government's pro-Java bias regarding economic development.[8]

These regional economic inequalities led to growing calls for greater political power by people from the peripheral regions of Indonesia, which led to the government's perception that national unity was coming under increasing threat. In response, the Indonesian government embarked on a programme of decentralisation during the late 1990s, after Suharto's authoritarian regime ended.[9] This shift meant that the different regions across the country would gain greater autonomy over local affairs and regional development, as power shifted significantly from the central to sub-national authorities.[10] By giving the different regions greater independence over regional economic

[4] "Indonesia Puts Green Growth at SEZ Forefront to Drive Investment," Global Green Growth Institute, accessed December 10, 2022, https://gggi.org/indonesia-puts-green-growth-at-sez-forefront-to-drive-investment/.
[5] Alexander D. Rothenberg and Della Temenggung, "Place-Based Policies in Indonesia: A Critical Review," World Bank Group, 2019, accessed December 10, 2022, https://documents1.worldbank.org/curated/en/376361571412939496/pdf/Place-Based-Policies-in-Indonesia-A-Critical-Review.pdf
[6] Mary Amiti, "Economic Geography and Wages," The review of economics and statistics 89, no. 1 (2007): 16, https://www.jstor.org/stable/40043071.
[7] Rothenberg and Temenggung, "Place-Based Policies in Indonesia," 3-4.
[8] Amiti, "Economic Geography and Wages," 15.
[9] Milson Febriyadi, "Agglomeration Economies and Decentralization Policy: the case of Indonesia's manufacturing sector" (MA diss., International Institute of Social Studies, 2021), 1.
[10] Tessa Talitha, Tommy Firman & Delik Hudalah, "Welcoming two decades of decentralization in Indonesia: a regional development perspective," *Territory, Politics, Governance* 8, no. 5 (2020): 690-691, https://doi.org/10.1080/21622671.2019.1601595.

development, economic activity and growth would become deconcentrated from Java and dispersed across the whole country, ensuring that the benefits of economic development could be equitably shared with the peripheral, outer islands of Indonesia.

As a result of the place-specific nature of SEZs, the SEZ strategy can therefore be understood as a way for the central government to increase and enhance the participation of local and regional authorities in promoting local economic development. Overall, the strategy was expected to alleviate uneven regional economic development by creating new economic nodes in regions where SEZs were established. This way, the different regions of Indonesia could enjoy the benefits of economic agglomeration and develop their regional economic strengths and international competitiveness as an investment destination.[11] As such the establishment of SEZs across Indonesia emerged as a hallmark of both the government's programme of decentralisation, as well as national economic and infrastructural development. This development strategy parallels that of the several Asian economies such as China, South Korea, and Thailand, which had adopted an SEZ strategy earlier in the 1970s and 1980s to spearhead their own economic transformation.

According to the World Bank, a modern SEZ typically consists of a geographically defined area under a single management that confers benefits to firms in order to incentivise them to locate there. Modern SEZs also provide firms with a separate customs area (often duty-free) to streamline import-export processes.[12] The World Bank's definition of SEZs encompasses free trade zones (FTZs), export processing zones (EPZs) or specialised zones, including technology parks, industrial zones, and so on.[13]

As of 2022, there were currently 19 SEZs established under the 2009 law concerning SEZs in total, of which 12 were already in operation, and the rest were still under development. So far, according to the 17th Coordinating Minister for Economic Affairs, Airlangga Hartarto, the 19 SEZs had attracted a combined investment of 64.4 trillion rupiah (4.53 billion USD) and provided jobs for about 23,000 workers.[14] *Table 1* provides a summary of the different types of SEZs that the government has established. However, many of Indonesia's SEZs were involved in potentially environmentally damaging sectors that could place the natural environment under significant stress.

No.	Name	Location	Primary Economic Sector(s)
1	Arun Lhokseumawe SEZ	Aceh	Energy, petrochemicals and other chemicals, palm oil, logging, and logistics
2	Sei Mangkei SEZ	North Sumatra	Palm oil, rubber, logistics and tourism
3	Batam Aero Technic SEZ	Riau Islands	Maintenance, repair, and overhaul (MRO)
4	Nongsa SEZ	Kepulauan Riau	IT-digital and tourism

[11] Febriyadi, "Agglomeration Economies", 23.
[12] The World Bank, Special Economic Zones: Performance, Lessons Learned, and Implications for Zone Development (Washington, DC: The World Bank Group), 9, https://documents1.worldbank.org/curated/en/343901468330977533/pdf/458690WP0Box331s0April200801PUBLIC1.pdf.
[13] Ibid. 3.
[14] VNA, "Indonesia's special economic zones attract over 4.5 billion USD," *Vietnam+*, October 14, 2021, https://en.vietnamplus.vn/indonesias-special-economic-zones-attract-over-45-billion-usd/209714.vnp

5	Galang Batang SEZ	Riau Islands	Bauxite mining and logistics
6	Tanjung Kelayang SEZ	Bangka Belitung	Tourism
7	Tanjung Lesung SEZ	Banten	Tourism
8	Lido SEZ	West Java	Tourism and creative industry
9	Kendal SEZ	Central Java	Goods manufacturing and logistics
10	Gresik SEZ	East Java	Energy, metals, electronics, and logistics
11	Singhasari SEZ	East Java	Tourism and digital technology
12	Sanur SEZ	Bali	Tourism and health
13	Mandalika SEZ	West Nusa Tenggara	Tourism
14	MBTK SEZ	East Kalimantan	Palm oil, energy, and logistics
15	Palu SEZ	Central Sulawesi	Base metals and logistics
16	Likupang SEZ	North Sulawesi	Tourism
17	Bitung SEZ	North Sulawesi	Coconut processing, fisheries, and logistics
18	Morotai SEZ	North Maluku	Fisheries and tourism
19	Sorong SEZ	West Papua	Nickel smelting, palm oil, forestry, and logistics

Table 1: Summary overview of Indonesia's SEZs established under the 2009 law concerning SEZs (as of 2022).[15]

Environmental Degradation by Special Economic Zones (SEZs)

One of the current obstacles to Indonesia's goal of sustainable economic development would be the large ecological footprint of its SEZs. While it could be attributed to the infrastructural demands and economic activities of SEZs, it is also important to note that such environmentally harmful practices were also enabled by a weak institutional and regulatory environment in the first place.

Direct causes

Infrastructural demands of SEZs

A major factor that accounts for whether an SEZ is successful is its connectivity with other markets in the region and the rest of the world.[16] To ensure this, the Indonesian government spared no effort in developing new transport infrastructure such as highways, railways, seaports and airports, as well as

[15] "SEZ Distribution Map," Republic of Indonesia National Council for Special Economic Zone, accessed December 10, 2022, https://kek.go.id/peta-sebaran-kek.
[16] The World Bank, Special Economic Zones, 50.

other industrial and logistical facilities within and beyond established SEZs.[17] Furthermore, increased migration due to increased economic opportunities also necessitated the expansion of urban infrastructure to accommodate population growth. In short, the necessity of large-scale Infrastructural expansion to support an SEZ operation would inevitably inflict harm on the local natural environment which was cleared to make way for new infrastructure development.

For instance, in the Batam, Bintan and Karimun (BBK) FTZ that primarily focuses on manufacturing activities, the pressures of infrastructural development resulted in widespread environmental degradation. The FTZ's strategic location within the Indonesia-Malaysia-Singapore Growth Triangle (IMS-GT) meant that the island had a high potential for development and economic growth.[18] To match this influx of investment, the Batam Industrial Development Authority (BIDA) pushed hard for a new phase of large-scale infrastructural development with new roads, highways, bridges, and shipyards being constructed to accommodate modern trade requirements.[19]

The construction of these supporting infrastructures to improve international and regional connectivity contributed to high levels of soil erosion as large swathes of forested areas had to be cleared for development.[20] Along the coast, land reclamation projects for the construction of housing, public facilities, services, and tourism in the northern sub-districts of Bengkong Laut, Sadai and Tanjung Buntung saw the destruction of almost 90% of mangrove forests in the area. These activities had knock-on effects on coastal communities that relied on the mangroves for their livelihoods. The deterioration in quality and destruction of nearby coral reefs contributed to a significant reduction in fish stocks.[21] The anthropogenic destruction of mangrove forests and coastal habitats also represented the loss of important carbon capture areas, resulting in larger volumes of greenhouse gases (GHG) being emitted into the atmosphere.[22] It was clear that the development of key supporting infrastructure for SEZs degraded local vegetation and coastal habitats responsible for maintaining the ecological balance and stability of the surrounding natural environment. Given the land-intensive nature of such an economic undertaking, some degree of environmental destruction arising from infrastructural requirements seemed unavoidable.

Economic activities in SEZs

The degradation of the environment could also be directly traced back to environmentally harmful activities that take place within SEZs. For example, in Batam, the electronics industry was known to be a major source of toxic waste. More specifically, accumulated waste in landfills emitting toxic and

[17] "Infrastruktur Pendukung KEK," Republic of Indonesia National Council for Special Economic Zone, accessed December 11, 2022, https://kek.go.id/infrastruktur.
[18] Ng Kwan Kee, "Batam, Bintan & Karimun Special Economic Zone: Attracting Foreign Investment," in *Facets of Competitiveness: Narratives from ASEAN*, ed. Ashish Lall (Singapore: World Scientific), 207-208.
[19] Agus P. Sari, "Environmental and Human Rights Impacts of Trade Liberalization: A Case Study in Batam Island, Indonesia" in *Human Rights and the Environment: Conflicts and Norms in a Globalizing World*, ed. Lyuba Zarsky (UK: Earthscan Publications Ltd), 126.
[20] Lee Poh Onn, *Reconciling Economic and Environmental Imperatives in Batam* (Singapore: ISEAS - Yusof Ishak Institute), 19 https://doi.org/10.1355/9789814818346.
[21] Alpano Priyandes and M. Rafee Majid, "Impact of Reclamation Activities on the Environment Study: Northern Coast of Batam, Indonesia," Jurnal Alam Bina Jilid x, no. 1 (2009): 4-9, https://www.academia.edu/545073/IMPACT_OF_RECLAMATION_ACTIVITIES_ON_THE_ENVIRONMENT_STUDY_AREA_NORTHERN_COAST_OF_BATAM_INDONESIA.
[22] Ani Widyastuti, Edy Yani, Ery Kolya Nasution and Rochmatino, "Diversity of mangrove vegetation and carbon sink estimation of Segara Anakan Mangrove Forest, Cilacap, Central Java, Indonesia," Biodiversitas 19, no. 1 (2018): 1-2, https://doi.org/10.13057/biodiv/d190133.

noxious fumes was burnt at the landfill without proper hazardous waste treatment.[23] Besides the electronics industry, Batam also hosted Indonesia's largest shipbuilding industry, with 115 out of a total of 250 shipyards across the archipelago located on the island as of 2017. The large presence of shipbuilders was very much due to Batam's status as an FTZ.[24] The industry was also a major polluter as its careless disposal of toxic waste from offshore ship cleaning caused pollution along the coastline and damaged nearby mangrove ecosystems.[25]

The environmental impacts of the BBK FTZ also parallel that of the Morowali Industrial Park (IMIP) in Sulawesi. The IMIP was jointly operated by Tsingshan, a Chinese state-owned enterprise and Bintang Delapan, an Indonesian firm. The industrial park specialised in the primary economic activity of nickel mining and processing, where their comparative advantage tended to be derived from much lower environmental standards. In particular, nickel smelters in IMIP utilised hydrometallurgy techniques that produced massive amounts of waste which were subsequently improperly disposed of in the surrounding areas or the sea.[26] This resulted in the contamination of nearby marine ecosystems and clean water sources that nearby communities relied on for their livelihoods.[27] The nickel smelters built by the Chinese enterprises were also known to rely on old, highly polluting technology and lacked necessary and proper environmental safeguards.[28]

In SEZs specialising in tourism, increased tourism activities have hurt the coastal and marine environment. This was evident in Tanjung Kelayang SEZ, which specialised in coastal tourism due to its status as a popular destination for snorkelling and diving. There have been reports of the coral reefs around Belitung suffering due to increased local human activity despite environmental protection being touted as one of the key pillars of the established SEZ.[29] A study found that about 34% of the total damage to coral reefs in the surrounding region could be traced back directly to non-natural human activities.[30] With the number of tourists visiting the region predicted to increase by more than 50 times in the future, the damage to coral reefs could potentially worsen if no action is taken to support sustainable coastal tourism development.[31]

Therefore, it is evident that the environmental impacts of SEZs in Indonesia are a classic case in the study of negative externalities in environmental economics. The combined effect of infrastructural development and economic activities in SEZs directly leads to the degradation of the physical environment and indirectly contributes to other downstream social and economic problems.

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[23] Lee, *Reconciling Economic and Environmental Imperatives*, 13-16.
[24] Siwage Dharma Negara, "Can the Decline of Batam's Shipbuilding Industry be Reversed?," *ISEAS Perspective* no. 10 (2017): 2-5, https://www.iseas.edu.sg/images/pdf/ISEAS_Perspective_2017_10.pdf.
[25] Lee, *Reconciling Economic and Environmental Imperatives*, 17-19.
[26] Tham Siew Yean and Siwage Dharma Negara, "Chinese Investments in Industrial Parks," ISEAS Yusof Ishak Institute Economics Working Paper no. 2020 - 08 (2020): 25, https://www.iseas.edu.sg/wp-content/uploads/2020/09/ISEAS_EWP_2020-08_Tham_Negara.pdf.
[27] Nabbilah Amir, "Implementation of Special Economic Areas in Indonesia (Case study in Morowali district, central Sulawesi Province)," *Advances in Social Science, Education and Humanities Research* 307, 1st Social and Humaniora Research Symposium (SoRes 2018) (2019): 582, https://doi.org/10.2991/sores-18.2019.132.
[28] Hans Nicholas Jong, "Nickel mining resisted in Indonesia," *China Dialogue*, December 12, 2019, https://chinadialogue.net/en/business/11727-nickel-mining-resisted-in-indonesia-2/.
[29] S. H. Hengky and Zaal Kikvidze, "Sustainable Coastal Tourism in Tanjung Kelayang, Indonesia," Tourism Planning & Development 18, no. 3 (2021): 366, https://doi.org/10.1080/21568316.2020.1763444.
[30] Pavita Raudina Sari, Ratna Saraswati and Adi Wibowo, "Spatial Temporal Analysis of Coral Reefs in Belitung Tourism Destination Islands," E3S Web of Conferences 73, 03024 (2018): 5, https://doi.org/10.1051/e3sconf/20187303024.
[31] Hengky and Kikvidze, "Sustainable Coastal Tourism," 366.

Indirect causes

Weak environmental regulation

The problem of environmental degradation can also be traced to Indonesia's lax legal and regulatory framework that permits and helps facilitate environmentally unsustainable and harmful practices, described above. Designed to attract more investment, SEZs offer foreign investors and businesses an array of benefits, such as an easier immigration process, corporate tax reductions, exemptions on import duties, and more.[32] As such, SEZs host more lax regulations than the rest of the country. In the context of economic recovery from the COVID-19 pandemic, the Indonesian parliament and President Widodo backed the swift passage of the Job Creation Act, which was a sweeping omnibus bill that sought to reduce regulations in a bid to stimulate a beleaguered economy by creating jobs and attracting foreign investment via deregulation.[33]

One major environmental law affected by the bill was Law No 32 of 2009 on Environmental Protection and Management (EPMA 2009). For example, the rights of the public to participate in the formulation of an Environmental Impact Assessment (EIA) that was protected under EPMA 2009 was reduced. Under the omnibus law, the Indonesian government limited public participation to only people living within the boundaries of an EIA study, and prevented environmentalists and environmental NGOs alike from participating.[34] The bill also eased requirements for economic projects, requiring only those considered as "high risk" to file an EIA.[35] For many, the legislation appeared biased towards economic growth at the cost of degrading ecosystems and biodiversity loss.[36] The weakening of the legal and regulatory environment ensured that the dual goals of economic growth and sustainability would continue to diverge.

Decentralised governance and corruption

In a way, state-led economic decentralisation through the SEZ strategy contributed to, and accelerated, environmental degradation on a national scale. The programme of political and economic decentralisation in Indonesia from the 1990s weakened the power of national environmental regulations and protections.[37] In particular, the Environmental Impact Management Agency (BAPEDAL), responsible for overseeing pollution in Indonesia and managing environmental interference, saw its powers and influence diluted as more autonomy was granted to regional governments to manage most policy sectors, including that of the environment.[38]

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[32] Ayman Falak Medina, "An Introduction to Special Economic Zones in Indonesia," *ASEAN Briefing*, January 12, 2023, https://www.aseanbriefing.com/news/an-introduction-to-special-economic-zones-in-indonesia/.
[33] Richard C. Paddock, "Indonesia's Parliament Approves Jobs Bill, Despite Labor and Environmental Fears," *The New York Times*, October 5, 2020, https://www.nytimes.com/2020/10/05/world/asia/indonesia-stimulus-bill-strike.html.
[34] Grita Anindarini Widyaningsih and Raynaldo Sembiring. "Environmental Protection in Indonesia after the Job Creation Law 2020." *Chinese Journal of Environmental Law* 5, no. 1 (2021): 102-3, https://doi-org.libproxy1.nus.edu.sg/10.1163/24686042-12340065.
[35] Callistasia Wijaya, "Indonesia: Thousands protest 'omnibus law' on jobs," *BBC*, October 8, 2020, https://www.bbc.com/news/world-asia-54460090.
[36] Paddock, "Indonesia's Parliament."
[37] Febriyadi, "Agglomeration Economies", 1.
[38] Nicole Niessen, "Decentralized Environmental Management", in *Environmental Law in Development: Lessons from the Indonesian Experience*, ed. Michael Faure and Nicole Niessen (Cheltenham: Edward Elgar Publishing, 2006), 143.

Decentralisation was expected to empower local governments to better manage their environment as it was assumed that they would have a better understanding of local environmental concerns as compared to the national government.[39] However, most of these governments lacked the technical and legal expertise to take on the task of environmental management. Instead of increasing commitment to environmental protection, most district and municipal governments made use of their increased autonomy to prioritise local and regional economic growth, often with "negative consequences for the environment within their territories."[40]

Furthermore, corruption also presented itself as an obstacle to the government's goal of environmental sustainability. While it was arguable that some degree of governing autonomy is necessary for a state as large as Indonesia to function, it opened the possibility for corrupt practices to take root. This was especially the case where the explosion of economic growth and an influx of investment presented a powerful incentive for local government officials and elites to abuse their positions of power to "capture the lion's share of profits available".[41] As they developed a personal stake in economic growth, they were less likely to pursue and enforce environmental regulations, which might inhibit the rate of economic growth.[42] This lack of political will to empower and fund environmental agencies to crack down on regulatory breaches meant that many businesses could continue their environmentally harmful practices with little to no consequence.

Growth and proliferation of Chinese investment

It is also important to note that the problem of environmental degradation could not be solely attributed to domestic factors. Foreign investors and firms could also play a crucial role in determining whether sustainable economic practices were adopted in SEZs.[43] As part of China's ambitious Belt and Road Initiative (BRI), Chinese companies ventured overseas to build their own SEZs, such as the IMIP, in the global south. In the case of Indonesia's mining industry, China was viewed as an especially attractive investor for the Indonesian government to work with as they could offer much cheaper technology and competitive prices for their services (due to Chinese government subsidies) compared to other countries like the USA and Japan. More importantly, they could provide the speed of work Indonesia required to meet its economic development goals. As part of its ambition to dominate international steel and battery markets, a study on Chinese capital flows found that "China (had) been very quick in building processing facilities", often at the cost of local environmental protection laws and regulations.[44]

The lack of regard for environmental protection laws and regulations by Chinese firms in this case, could also exacerbate the causes mentioned above. With corruption already a problem in Indonesia,

[39] Lee, *Reconciling Economic and Environmental Imperatives*, 9.
[40] Niessen, "Decentralized Environmental Management," 166.
[41] Ramón López, and Mitra Siddhartha, "Corruption, Pollution, and the Kuznets Environment Curve." *Journal of Environmental Economics and Management* 40, no. 2 (2000): 139, https://doi.org/10.1006/jeem.1999.1107.
[42] Ibid. 137–50.
[43] "Report on Fostering Sustainable Development through Chinese Overseas Economic and Trade Cooperation Zones along the Belt and Road: United Nations Development Programme," UNDP, accessed January 20, 2023, 5-6, https://www.undp.org/china/publications/report-fostering-sustainable-development-through-chinese-overseas-economic-and-trade-cooperation-zones-along-belt-and-road.
[44] Septa Dinata, Muhamad Ikhsan, Mary S. Silaban and A. Khoirul Umam, "The Outcome of China's Investment in Indonesia: Lessons from the Nickel Industry," in *A Study of Chinese Capital Flows to Six Countries: Indonesia, Mitigating Governance Risks From Investment in Southeast Asia*, (Center for International Private Enterprise), 19-20, https://www.cipe.org/wp-content/uploads/2020/04/MXW_CIPE_ChinaReport_20200420_Indonesia.pdf

an influx of Chinese investments could potentially further encourage corrupt practices that were only concerned with profits and not environmental protection.[45]

Policy Options

Considering the complexity of Indonesia's SEZ strategy, reforms at the governmental, regional, and sectoral levels would be necessary for the goal of sustainable economic development to be effectively addressed. To achieve sustainable economic development, the Indonesian government could consider prioritising mitigation strategies to reduce the overall ecological footprint of all existing SEZs. In addition, it would also be important for the government to consider ways to minimise the environmental impacts of future SEZs. As such, present policy options for the government can be divided into two categories — those that attempt to mitigate the environmental impacts of existing SEZs, and those that seek to establish sustainable practices that minimise and prevent environmental degradation.

Table 2 lists six potential policy options that seek to address the different causes of the problem of environmental degradation. Options 1 and 2 aim to mitigate the impacts of current SEZs and Option 3, sector-specific problems. On the other hand, Options 4, 5 and 6 focuses more on reforms that would encourage sustainable practices that can contribute to current mitigation efforts and minimise future impacts.

Mitigation of current environmental impacts	Minimising and preventing future environmental impacts
Option 1: Accelerating transition towards renewable sources of energy Option 2: Strengthening environmental regulation and enforcement frameworks Option 3: Economic sector-specific reforms a) Developing sustainable tourism b) Sustainable resource extraction	Option 4: Foster sustainable infrastructural development Option 5: Collaborate with foreign investment partners Option 6: Increase multilateral and international regulatory cooperation

Table 2: Overview of some potential policy proposals

Option 1 — Accelerating transition towards renewable sources of energy

As some SEZs still relied on traditional fossil energy sources such as coal and gas to support business operations, one major way in which Indonesia could reduce the carbon footprint of their SEZs was by accelerating their transition towards renewable sources of energy. Indonesia had enormous potential with regards to Renewable Energy Technology (RET), as 17% of the archipelago was already running on an energy mix of geothermal, hydropower and biomass.[46]

However, the shift towards more renewable sources of energy was hampered by "a lack of bankable projects"[47] that did not provide investors with enough returns. In Indonesia, issues of "inconsistent

[45] Ibid. 25.
[46] International Energy Agency. *World Energy Balances 2020*; International Energy Agency: Paris, France, 2020. https://www.mdpi.com/1996-1073/14/21/7033. 2
[47] Ronja Bechauf, *How Can Indonesia Foster Sustainable Infrastructure Solutions That Deliver Low-Carbon Development and Bring Additional Benefits?* (International Institute for Sustainable Development, 2021), 14, https://www.iisd.org/system/files/2021-07/indonesia-sustainable-infrastructure-solutions.pdf.

policies, bureaucracy, and a lack of institutional capacity, as well as low electricity purchase prices and regulated low end-consumer tariffs"[48] contributed to difficulties in identifying bankable projects due to the uncertainty regarding revenue streams. As with their SEZs, the Indonesian government could also stand to benefit by streamlining regulations, tax policies and setting clear, consistent guidelines for renewable energy projects, as well as incorporating long-term planning to raise investor confidence.[49]

Option 2 — Strengthening environmental regulation and enforcement frameworks

The continued liberalisation of the economy to increase investments in SEZs or to have foreign firms set up their own SEZs could potentially increase corruption and abuse of powers by government officials, who may offer their assistance to help "grease the wheels" in exchange for bribes and incentives.[50] The Indonesian government could strengthen both their national and local regulatory environment to stymie and eliminate such corrupt practices that contributed to environmental degradation. This could be done by strengthening and giving greater autonomy to national agencies like the Corruption Eradication Commission (KPK) that could investigate and crack down on corrupt practices that contributed to lapses in the enforcement of environmental regulations.

However, doing so would require immense political will in the highest echelons of power within the Indonesian government and elite. This would prove to be a challenge as the investigative powers of the KPK had been significantly weakened under President Widodo's administration.[51]

Option 3A — Developing sustainable tourism

The impacts of increased human activity and tourism-induced problems at natural sites could be mitigated via the implementation of a sustainable tourism policy. In this respect, Calvià, a municipality within the Spanish Balearic Islands offers Indonesia an illustrative case through which it can draw lessons from its implementation of a sustainable tourism policy. Under Calvià's 1997 Local Agenda 21 (LA21) Action Plan, a declassification law was created to revert land that was originally zoned for urbanisation. New regulations for mooring and anchoring were also introduced to limit and reduce anchor damage and harbour congestion. The regional government also instituted a tax on water to promote conservation as well as an eco-tax to fund rehabilitation and regenerative projects.[52]

Indonesia could stand to benefit by incorporating some of the same criteria and principles that Calvià based their action plan on to suit their own context. These could entail conducting studies to determine tourist demand, and the carrying capacity of the tourism site.[53] Such studies would allow SEZ administrations to carry out development planning over the long-term that would be better aligned with local requirements and national sustainability goals.

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[48] Ibid. 14.
[49] Ibid. 16.
[50] Septa Dinata, Muhamad Ikhsan, Mary S. Silaban and A. Khoirul Umam, "The Outcome of China's Investment in Indonesia," 25-27.
[51] The Jakarta Post. "Indonesia Demonstrates That Civil Society as a Backbone of Democracy Is a Myth." *The Jakarta Post*, January 20, 2023, https://www.thejakartapost.com/opinion/2022/12/05/indonesia-demonstrates-that-civil-society-as-a-backbone-of-democracy-is-a-myth.html.
[52] Rachel Dodds, "Sustainable Tourism and Policy Implementation: Lessons from the Case of Calviá, Spain." *Current Issues in Tourism* 10, no. 4 (2007): 307-308. https://doi.org/10.2167/cit278.0.
[53] Ibid. 304-305

They could also consider incorporating more "participatory and open working methods,"[54] as raising stakeholder involvement could aid in implementing the policy. In Calvià, NGOs raised awareness of sustainability and environmental issues, pushing them into public policy discourse through media. As such, their exclusion from the development and implementation of policy in Indonesia have been viewed as "detrimental to achieving sustainability".[55] However, implementing such a policy might find resistance amongst some stakeholders. The introduction of more bureaucracy and processes to increase the rigour of the development of SEZs could also be viewed as incongruent with the liberalised business practices that made SEZs competitive and attractive in the first place.

Option 3B — Sustainable resource extraction

In the case of SEZs that specialise in primary sectors such as the mining and palm oil industries, enhancing the management of natural resources and the surrounding environment was key to reducing the environmental footprint of extractive activity. This could be done through the adoption of a sustainability framework. In Finland, the Green Mining (GM) concept was introduced as a policy tool to transform the country into a global leader in sustainable mining. More importantly, the GM concept emphasised the principles of promoting materials and energy efficiency, as well as minimising adverse environmental impacts of all mining operations.[56] To this end, the Finnish Fund for Innovation launched the Green Mining R&D&I Program (GMP) that targeted technological innovations and "new businesses that bring together value networks of small and medium-sized companies, research institutes and universities in Finland and globally".[57]

In the case of the Indonesian mining industry, the improvement of technologies can increase energy efficiency, and minimise the amount of waste that is produced as by-products. However, the excessive research and development costs of such technologies could hinder their eventual adoption. In response, the Indonesian government could consider providing firms with subsidies to help offset the steep cost of technology adoption or taking up a larger role in the investment environment by using their buying power to send a signal to the market to innovate and invest in better technologies.

Option 4 — Foster sustainable infrastructural development

Future infrastructure projects can be assessed along the Triple Bottom Line (TBL) framework that is concerned with sustainable development, namely in the pillars of economic, social, and environmental development. The economic pillar quantifies the potential impacts of climate change on infrastructure, the social pillar measures the vulnerability of communities, and the environmental pillar focuses on measuring the environmental impacts of the infrastructural project.[58] By adopting such a framework, sustainable infrastructural planning and development can be carried out in the long-term as present and future impacts were considered during the process.

An analysis of climate-conscious road investments in the Sacramento region of California demonstrated the combined long-term benefits of TBL investments. By using individualised data on

[54] Ibid. 304.
[55] Ibid. 314.
[56] Pekka A. Nurmi, "Green Mining – A Holistic Concept for Sustainable and Acceptable Mineral Production," *Annals of Geophysics* 60, Fast Track 7 (2017): 3-4. https://doi.org/10.4401/ag-7420
[57] Ibid. 5.
[58] Schweikert, Amy, Xavier Espinet, and Paul Chinowsky, "The Triple Bottom Line: Bringing a Sustainability Framework to Prioritize Climate Change Investments for Infrastructure Planning," *Sustainability Science* 13, no. 2 (2017): 377–91. https://doi.org/10.1007/s11625-017-0431-7.

each pillar, the study showed how the TBL framework effectively designed and developed transportation infrastructure that addressed sustainability concerns. These developments managed to significantly lower carbon dioxide emissions in the process of construction as well as connect rural areas to urban developments, promoting social integration and facilitating higher wage work for inland communities.[59] Frameworks like the TBL demonstrate that infrastructure development and modernisation do not necessarily have to come at the expense of environmental quality.

Option 5 — Collaborate with foreign investment partners

While foreign investors could be partly to blame for the environmentally harmful practices adopted in some SEZs, the onus remained on regional and national governments to manage their environment. Several international development initiatives maintained a commitment to green development amidst economic progress. Even in the Chinese-led Belt and Road Initiative, construction and dissemination of environmentally conscious actions had been ingrained in its 'Green Belt and Road Initiative'. Policy recommendations like the Belt and Road Ecological and Environmental Protection Cooperation Plan and the Belt and Road Green Investment Principles had been instituted to guide development.[60] However, despite these lofty commitments, the BRI had fallen short in achieving environmental protection. With a high reliance on coal-fired plants, extractive mining activities and carbon-emitting infrastructure, the BRI was seen as China exporting its pollution-heavy economic development model to the global south.[61]

Thus, it remained the responsibility of local administrations and the government to ensure that investors complied with local and national environmental laws and regulations. One way Indonesia could ensure this was to be more careful in the selection of Chinese investment partners.[62] More specifically, Indonesia could consider implementing more stringent criteria that placed greater emphasis on environmental protection in the assessment of foreign investment projects. Furthermore, given that regulation would become increasingly difficult once transnational projects were underway, the preliminary negotiations of reasonable GHG restrictions and green technology financing would promote positive spill over effects that promoted sustainable development across the region.[63] These measures would ensure that Foreign Direct Investment (FDI) does not clash with environmental obligations and interests.

Option 6 — Increase multilateral and international regulatory cooperation

As the 2013 Southeast Asian haze crisis demonstrated, environmentally harmful practices could have transnational impacts. Apart from domestic reform, engagement with regional and international partners could play a significant role in creating a more pro-environment regulatory climate. This could potentially address concerns of a "race to the bottom" triggered by inter-jurisdictional competition, where the relaxation of environmental regulations in SEZs elsewhere could potentially

[59] Ibid. 382-386.
[60] Xue, Haili, Xiao Lan, Qin Zhang, Haoguang Liang, and Zixiao He. "Assessment of the Green Development Level for Participating Countries in the Belt and Road Initiative." *Annals of Operations Research*, 2021. https://doi.org/10.1007/s10479-021-04440-2.
[61] Harlan, Tyler. "Green Development or Greenwashing? A Political Ecology Perspective on China's Green Belt and Road." *Eurasian Geography and Economics* 62, no. 2 (2020): 203. https://doi.org/10.1080/15387216.2020.1795700.
[62] Septa Dinata, Muhamad Ikhsan, Mary S. Silaban and A. Khoirul Umam, "The Outcome of China's Investment in Indonesia," 19-20.
[63] Lan, Qingxin, Wan Tang, and Qiao Hu. "Estimation of China's Green Investment Efficiency in Belt and Road Countries -Based on SBM-Undesirable Model and Malmquist Index Model." *Frontiers in Energy Research* 9 (2022): 3, https://doi.org/10.3389/fenrg.2021.802946.

lead to Indonesian SEZs doing the same out of fear of alienating potential investors.[64] In other words, transnational collaboration could help prevent the emergence of the above described prisoners' dilemma-like situation with regards to environmental regulation.

In this respect, the creation of the landmark, legally binding ASEAN Agreement on Transboundary Haze Pollution represented the great potential for regional cooperation on environmental regulation. The introduction of agreed upon regional standards with regards to foreign investments and environmental regulation could reduce incentives for governments to lower regulations. However, for such a proposal to be successful, immense political will and commitment from all ASEAN member states would be necessary, a challenging task given the diverse economic needs and contexts of all members.

Evaluation of Indonesia's Current Policy Responses

In response to the causes of the problem of environmental degradation by SEZs, the Indonesian government has implemented some of the above-described policy proposals, among others.

"Greening" SEZs

With regards to making SEZs "greener", the Indonesian government partnered with organisations such as the Global Green Growth Institute (GGGI) to explore ways in which green growth concepts could be applied to SEZs to foster sustainable economic development. Together with GGGI, an extended cost benefit analysis (eCBA) was carried out in Sei Mangkei SEZ to explore investment opportunities for bankable projects in "renewable energy, waste management, sustainable palm oil and freight logistics".[65] Apart from the recommendation of "green growth intervention" projects that could contribute to minimising the SEZ's environmental footprint, the eCBA also identified key factors that would determine whether a transition to a green growth model was successful. Some of these include the implementation of public-private partnership schemes, as well as the mandating of energy efficiency and carrying out more quantitative studies to measure the carrying capacity of the surrounding environment.[66] These policies sought to boost the Sei Mangkei SEZ as a model of green growth in the nation and pre-emptively mitigate any negative spill over of its rapid development.

However, this partnership appeared to cover only SEZs that were directly established by the Indonesian government.[67] While this was a step in the right direction, the initiative suffered from limited coverage as it excluded other types of SEZs established by other domestic and foreign firms with less government participation.

Green Infrastructure

Incorporating green infrastructure into Indonesia's SEZ and urban development could minimise environmental degradation. These measures could come in two forms: (1) the incorporation of

[64] Benjamin J. Richardson, "Is East Asia Industrializing Too Quickly? Environmental Regulation in Its Special Economic Zones," *UCLA Pacific Basin Law Journal* 22, no. 1 (2004): 154, https://escholarship.org/uc/item/0d12m4vm.
[65] "Special Economic Zone Sei Mangkei: Moving Towards Green Growth," Global Green Growth Institute, accessed October 7, 2022, https://gggi.org/wp-content/uploads/2018/03/SeiMangkei_Booklet_FINAL.pdf.
[66] Ibid.
[67] "Indonesia Puts Green Growth at SEZ Forefront to Drive Investment," Global Green Growth Institute, accessed December 10, 2022, https://gggi.org/indonesia-puts-green-growth-at-sez-forefront-to-drive-investment/.

ecology into Indonesia's infrastructure to ensure ecosystem services remain available to citizens, and (2) investment in carbon-neutral development.

Indonesia was institutionalising the former option, mandating the incorporation of at least 30% Green Open Space (GOS) in all urban centres through their enactment of Law No. 26/2007 concerning spatial planning. The policy was implemented as an attempt to raise the quality of life, while simultaneously achieving the goals sustainability and the reduction of negative impacts to the environment due to poor space utilization.[68] Green open spaces that consist of trees, shrubs, and grass perform the immensely beneficial ecosystem service of producing clean, pollutant-free air and sequestering carbon from the atmosphere, as well as the promotion of more eco-centric lifestyles and values.[69] However, the law had not been fully implemented across all Indonesian urban areas. One example is Bekasi City, which had been unsuccessful in meeting the target 30% GOS.[70] Ecosystem services have become an afterthought of urbanisation rather than a fundamental priority.

Indonesia was also pushing for standardised "green buildings", which incorporated elements of the TBL framework of sustainability in construction and operation. Though they tended to cost 10-15% more to construct, the eventual cost savings from higher energy efficiency satisfied the economic value of the investment. Indonesia employed a rating system known as GREENSHIP from Green Building Council Indonesia (GBCI), an independent institution to certify green buildings in Indonesia.[71] Using criteria such as sustainable site development, energy and water conservation and environmental management, buildings could be certified "green". In a survey conducted with professionals in the field, there was consensus amongst the respondents that the government should take a more proactive role in accelerating implementation.[72] Since the GBCI was an institution that operated independently from the government, it could not enact policies and regulations to expedite green building development.[73] To scale up the establishment of green buildings, especially in SEZs where local governments have already taken a leading role in construction, green building ratings could be more widely shared such as through workshops or through increased governmental recognition, to ensure that appropriate standards were met.

Green FDI

The influx of foreign capital into newly liberalised Indonesian SEZs has raised concerns about their environmental impact. A study had found that 40% of Chinese-backed development projects (which includes power plants, roads, railways, and dams) carried serious risks to Indonesia's natural environment and biodiversity.[74] For every SEZ which promoted sustainable development, several others threatened local communities and biodiversity. Certain overzealous policies, such as the

[68] "Law of the Republic of Indonesia No. 26 of 2007 concerning Spatial Planning," FAOLEX Database, accessed May 19 2023, https://www.fao.org/faolex/results/details/en/c/LEX-FAOC163446/.
[69] Ajrina, H, and I Kustiwan. "From Green Open Space to Green Infrastructure: The Potential of Green Open Space Optimization towards Sustainable Cities in Bekasi City & Regency, Indonesia." IOP Conference Series: Earth and Environmental Science 399, no. 1 (2019): 2, https://doi.org/10.1088/1755-1315/399/1/012130.
[70] Ibid. 3-4.
[71] Berawi, Mohammed Ali, Perdana Miraj, Retno Windrayani, and Abdur Rohim Berawi. "Stakeholders' Perspectives on Green Building Rating: A Case Study in Indonesia." *Heliyon* 5, no. 3 (2019): 6, https://doi.org/10.1016/j.heliyon.2019.e01328.
[72] Ibid. 21.
[73] Ibid. 6.
[74] Pramono, Albertus Hadi, Habiburrahman A. Fuad, Budi Haryanto, Mochamad Indrawan, Nurlaely Khasanah, Masita Dwi Manessa, Kartika Pratiwi, et al., "Mitigating Social-Ecological Risks from the Surge in China's Overseas Investment: An Indonesian Profile." *Discover Sustainability* 2, no. 1 (2021): 4, https://doi.org/10.1007/s43621-021-00069-0.

Omnibus Law, exemplify Indonesian environmental mismanagement. In over-emphasising investment security, Indonesia could be permitting environmentally degrading activities.

One potential pathway would be to pivot towards production of goods serving the green economy, such as lithium-ion batteries, an essential asset of the electric car industry.[75] Indonesia could double its focus on these green technologies and progress into the production of more value-added products rather than serve as a primary exporter of raw materials. By focusing and capitalizing on emerging green industries, SEZs could be expected to also reduce their environmental footprint. The government would have to play a key role in areas such as due diligence, setting national standards, and strictly enforcing them across all districts.

Sustainable development is a perplexing task that many developing economies struggle with. Indonesia's path towards sustainable development would be challenging. While SEZs could help to drive economic growth, there were inherent risks of domestic mismanagement and foreign pressures. While the onus was on governments to manage their environmental and climate commitments, FDI would have to find ways to complement the host nation's strategy for sustainable growth and development.

Discussion Questions

1. Explain the benefits and drawbacks of Indonesia's SEZ strategy to achieve economic development.

2. How can SEZs in Indonesia be transformed to become engines of sustainable economic development? Can economic liberalisation complement environmental protection?

3. What types of reform (e.g., national, local/regional, and sector-specific) should be prioritised?

4. In what other ways can Indonesia adjust its SEZ policies to address its environmental challenges and/or achieve sustainable and green growth?

[75] Ibid. 10.