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Author: Hung, Jason

Source: Environmental Health Insights, 18(1)

Published By: SAGE Publishing

URL: https://doi.org/10.1177/11786302241258348

Transitioning to Greener Sino-Thai Belt and Road Initiative: How China Finance Thailand's Environmental Sustainability

Environmental Health Insights
Volume 18: 1–9

DOI: 10.1177/11786302241258348

Jason Hung
Department of Sociology, The University of Cambridge, Cambridge, UK.

ABSTRACT: As of today, China's Belt and Road Initiative (BRI) continues showing signs of its transition towards green development; whilst the Thai sustainable tourism industry is encountering substantial environmental problems of unfavourable water quality and waste management outcomes. This paper dissects how China has been transitioning into the practice of a greener BRI, as well as how Thailand has benefitted from its greener BRI partnership with China in recent years. This paper delineates the major environmental issues faced by Thailand, in order to suggest why Thailand needs to urgently and responsively address any notable environmental concern for long-term economic growth and sustainability. There is a lack, if not an absence, of existing studies that analyse Sino-Thai green BRI partnerships with the presentation of supporting, updated data and statistics. The findings presented in this paper respond to such a research gap. This paper concludes by arguing that should China's distribution of development finance to Thailand be able to enhance the latter's environmental health and landscape, more Southeast Asian (SEA) and global emerging powers may develop an increasing interest in forming or strengthening green BRI partnerships with China. In the long run, such an optimistic outcome allows China's diplomatic influence to grow further. China's greener development finance plan is an ambitious, globally impactful strategy. Such an ambitious strategy aims to capitalise on the opportunities to address countries' developmental and environmental needs to boost China's global competence and image, in addition to elevating its diplomatic influence.

KEYWORDS: Belt and road initiative, green diplomacy, BRI diplomacy, environmental health, development finance

RECEIVED: March 3, 2024. **ACCEPTED:** May 14, 2024.

TYPE: Original Research

FUNDING: The author received no financial support for the research, authorship, and/or publication of this article.

DECLARATION OF CONFLICTING INTERESTS: The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

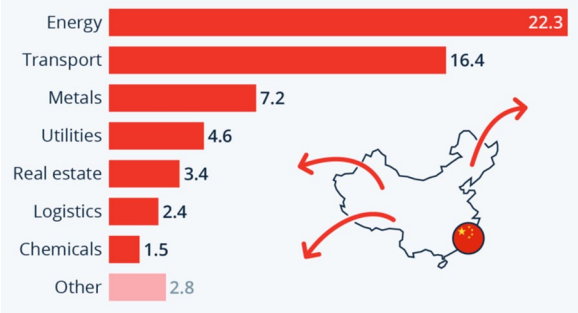
CORRESPONDING AUTHOR: Jason Hung, Department of Sociology, The University of Cambridge, 68 Collegiate Castle Street, Castle Park, Cambridge CB3 0SZ, UK.
Email: ysh26@cam.ac.uk

Introduction

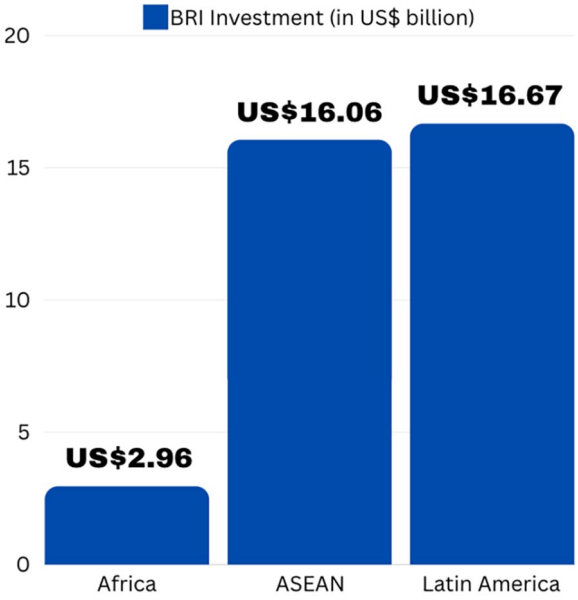
China's Belt and Road Initiative (BRI), alternatively known as the New Silk Road, is an ambitious bilateral and multilateral infrastructure project. The BRI was launched in September 2013 by the People's Republic of China President Xi Jinping, facilitating a vast collection of development and financial investment initiatives in East Asia, Europe, Africa, Oceania and Latin America. Geopolitical experts perceive the BRI as a strategic output to enhance China's global economic and political influence.[1] Since the BRI programme was introduced, the Asian Infrastructure Investment Bank has cooperated with the World Bank and the Asian Development Bank, for example, to initiate developmental projects globally. The Chinese Government intends to initiate a series of large projects to build infrastructures, such as railways, highways, pipelines, electric transmission networks, airports and other related matters across the globe. Here China hopes that the implementation of a series of global infrastructural projects can create a stronger degree of economic interconnection between global economic powers, in part, in order to internationalise the Chinese currency and effectively use their foreign currency reserve.[2] As of 2020, China had been among the jurisdictions with the highest number of international investment agreements (IIAs) (a total of 149), which included 127 bilateral investment treaties and 22 free trade agreements. Prior to launching the BRI scheme in October 2013, China already had existing IIAs with 53 of the 68 identified BRI jurisdictions. With China's BRI scheme under expansion, the web of BRI-related IIAs will continue to grow in the long run, making China an even more indispensable bilateral or multilateral partner for developmental finance over time.[3] For decades, the Chinese economy is strongly connected with other economies. China is a major consumer of copper, iron and ample other resources produced by African countries. China also heavily relies on the production of oil and liquefied gas from the Arabian Peninsula.[2] With the presence of the BRI scheme and other signed bilateral and multilateral agreements, China's interconnectivity with the globe continues to grow.

The EU has expressed concerns that China may use its BRI scheme to upset the order of the global dynamics of trade liberalisation, in addition to materialising on BRI to pose political and strategic implications on the EU themselves and other regions. The EU also worries that China may seek to create political and economic dependencies amongst the poorer eastern EU member states through using its' infrastructure investment to exert political leverage. Similar concerns are expressed by the United States, as demonstrated by the United States' attempt to prevent other countries from joining the board of China's created instrument of economic cooperation - the Asian Infrastructure Investment Bank.[4] Below this paper will briefly address how the EU has set up an a green and sustainable alternative to BRI to defy or compete with China's increasing global dominance.

China has always publicly described the BRI as inclusive and designed to create mutual benefits with its partner countries. However, western critics address that the Asian



Graph 1. Total China's BRI Investment in 2021, by Sector (in US$ billion).
Source: Green Fiance & Development Centre.



Graph 2. China's BRI investment in emerging regions in 2020 (in US$ Billion).
The diagram is created by the author.

Infrastructure Investment Bank, for example, may become a system of supply-chain management for China by creating jobs in the BRI partner countries through which the BRI passes the supply inputs to the development of Chinese industrial production.[4] Not only is China receiving an influx of criticisms against its BRI scheme politically and economically, but an increasing amount of noise has been circulated that denounces the environmental concerns inflicted by China's BRI. This paper will therefore focus on examining China's greener BRI approach, in addition to exploring whether such an approach is conducive to environmental conservation.

To date, China has spent an estimated US$ 1 trillion on the BRI, with an additional forecast that the country's total expenses over the life of the initiative could reach some US$ 8 trillion[1,5] (see Graph 1). Such statistics demonstrate the vast scale of the initiative and suggest how ambitious China has been when launching bilateral and multilateral development finance and infrastructure projects (see Graph 2). Second, given the potential for massive expansion of the scale of the BRI project, this paper, supported by secondary data, dissects how such an initiative can be fully capitalised as a channel to addressing some of the most devastating and concerning multifaceted issues in the developing world, including the environmental risk of Thailand. According to the Lowy Institute Asia Power Ranking's 2023 data, China was the country that diplomatically influenced Thailand the most. Here 21.3% of bilateral trades Thailand made were conducted with China, followed by 11.6% with Japan and 11.2% with the United States.[6] Such findings suggest that the bilateral diplomatic and economic ties Thailand and China have built almost quantifiably double the ties between Thailand and each of Japan and the United States. The notable bilateral trade and diplomatic and economic ties between China and Thailand prompt my development of this paper, as how well Sino-Thai BRI partnerships can finance Thailand's environmental sustainability is indicative of whether China's expanding and greener BRI project will succeed when partnering with other emerging trading economies in the long run.

In Asia, some USD 14.7 trillion is needed by 2030 to fulfil the continent's developmental goals. Within Asia's developmental challenges, 400 million individuals still lack access to electricity and 300 million face a shortage of access to safe drinking water.[5] In 2017, some 56% of Asia's infrastructure needs belonged to the (renewable) power supply and another 3% referred to the provision of clean water and basic sanitation, as per data released by the Asian Development Bank.[5] Such indicators suggest that Asia has been subject to substantial developmental needs, especially in environmental health and sustainment. The introduction and expansion of the BRI should, therefore, be fully materialised to satisfy both the developmental needs of developing Asia and the economic and geopolitical ambitions of China.

Despite the existence of legal standards of PM2.5, compliance with the World Health Organisation (WHO) Air Quality Guidelines and the presence of a national health and climate change strategy, Thailand has witnessed concerning environmentally-inflicted health impacts. Here a total of 23% of deaths from stroke and ischaemic heart disease are caused by air pollution. Also, a sum of 38% of deaths from diarrhoea caused by unsafe drinking water, sanitation and insufficient personal hygiene are recorded. Moreover, Thailand is subject to nine times more heat deaths in 2050 relative to the 1961 to 1990 period under a high emissions scenario.[7] Thailand's death-inflicted environmental risks are notable that prompt this paper to focus on the examination of the country's eco-health, in order to explore any existing interventions or policy directions that help mitigate such costs per se.

Thailand launched its first *National Environmental Health Strategic Plan* between 2009 and 2011 that allowed all relevant agencies to use the guide to implement their environmental programmes. Thailand's endeavours are a testament to the country's commitment to creating a balanced setting that promotes the health and well-being of local citizens and communities in order to achieve the Sustainable Development Goals.[8]

Under the national adoption of an effective environmental strategic plan, the WHO and Thailand's Department of Health have built local strategies to mitigate the health impacts of environmental damages, so as to build more resilient and innovative communities. For example, the collaboration endeavours propelled the development of the Huai Luek Royal Project that helped reduce air pollution from traditional crop burning.[9] From national strategic planning to localised community-level interventions, Thailand has demonstrated a commitment to change the landscape of its environmental health, aiming to build a more environmentally resilient and friendly habitat.

Given the notable environmental issues encountered by Thailand and the country's determination to improve its environmental sustainability, this paper focuses on Thai environmental contexts because China and Thailand, as mentioned, have strong BRI ties, so studying the ties per se in association with Thailand's environmental sustainability enables an assessment of whether China's greener BRI has panned out internationally. Such an investigation is relevant to non-Thai, global contexts, given many emerging powers also encounter the circumstances of choosing to strengthen its bilateral BRI ties with China and facing concerns about domestic and regional environmental conservation issues.

China's Shift to Greener BRI

In this section, this paper highlights how China has been transitioning into the practice of a greener BRI. Also, this section discusses how Thailand has benefitted from its greener BRI partnership with China in recent years. The discourse presented in this section allows the justification of greener BRI partnerships practised between China and Thailand, pathway the way to the discussion on how Thailand's long-term environmental sustainability will be impacted.

China's 4 state-owned banks are responsible for lending financial resources to state-owned enterprises (SoEs) for BRI investment. Private enterprises, compared to SoEs, are less engaged in participation owing to the lack of short- and medium-term returns on investment.[10] It is noteworthy that Chinese enterprises are increasingly present overseas. When looking at the Chinese's outward foreign direct investment stocks since 2013, these stocks per se grew from US$ 691.3 billion in 2013 to US$2,413.4 billion in 2020. These figures do not distinguish foreign direct investment made by SOEs and private enterprises. However, Marcoux and Sylvestre-Fleury[11] suggest that these figures must be read in parallel with existing studies that document the efforts deployed by China to increase the competitiveness of domestic SOEs and their presence at the international level. For example, a US Congressional Research Service Report suggests that Chinese leaders have encouraged Chinese firms, primarily SOEs, to invest overseas.[11] Under the practice of the BRI, China has become the world's biggest international creditor. Despite the actual figure being unknown, western experts expect the values of debt to reach at least hundreds of billions of US$.[12] Developing Asian countries such as Sri Lanka, the Maldives and Laos have publicly encountered difficulties in repaying the debt. Western critics coin the BRI as China's geopolitical strategy of a 'debt trap' diplomacy.

In addition to the conventional criticism against the BRI for allegedly favouring China at the expense of economically burdening the developing world, China's initiative is condemned as causing environmental damage.[13] Traditionally associated with infrastructure development, the BRI has, however, undergone a notable transformation towards green development, as indicated by the latest available data. The conventional path of the BRI is centralised on infrastructure construction, in which roads, rail lines, seaports, airports and dried ports have been built. For example, the World Bank reports that such large-scale transportation projects expose countries and local communities to suffer from carbon dioxide (CO_2) emission growth by some 7% in total.[14] In response to the environmental risks and concerns: the BRI has developed multiple sub-routes, such as Digital Silk Road, Clean Silk Road and Green Silk Road to deliver developmental finance to the bilateral or multilateral partnerships with developing countries for green development.[15]

In 2021, China launched the Global Development Initiative, with participation from over 60 partner countries.[15] China has actively been focussing on redirecting its bilateral and multilateral efforts to address a range of development issues, including poverty reduction, universal education, agricultural development and climate action. Between 2014 and 2023, China's cumulative BRI investments in construction contracts have surged to almost US$ 600 billion, with non-financial investments accounting for US$ 418 billion.[15] While the overall investment size is smaller than that of SoEs, Chinese private enterprises have demonstrated significant efforts to pivot towards green and renewable development. Some 60% of their equity investments, from 2000 to 2022, were directed towards green projects, encompassing the construction of solar power and hydropower systems.[15] China is aware of the presence of challenges if its BRI fails to promote long-term environmental sustainability. In recent years, therefore, statistics suggest that China has had a disposition for green finance, despite the relevant green finance laws and regulations and their impacts on BRI's sustainability having significant room for improvement.[16] China's BRI demonstrates signs of its transition towards green development in the foreseeable future, where the initiative's sustainability and environmental influence should continue to improve over time.

China has continued to show an interest in employing green BRI and mitigating Thailand's environmental health. For example, in 2021, Thailand approved an offer from the state-owned Chinese firm Norinco International to develop a US$ 2.1 billion water diversion project in Thai territories.[17] Moreover, China continues to share technologies to help

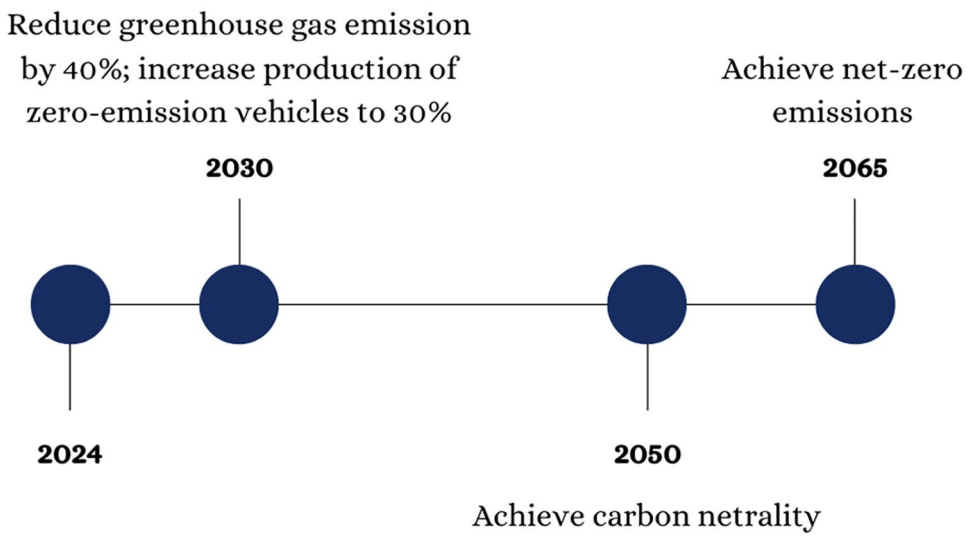


Diagram 1. Thailand's long-term goals to reduce greenhouse gas emission. The diagram is created by the author.

Southeast Asian (SEA) countries, including Thailand, transition from reliance on fossil fuels. In March 2021, Thailand announced its intention to draft a plan for the country to reach net-zero carbon emissions by 2050 (which was later postponed to 2065) (see Diagram 1). To minimise its reliance on fossil fuels, Thailand has undergone a policy shift towards solar projects. Here Sino-Thai collaboration projects enable Thailand to use China-made solar panels and China-built solar power stations.[18] Within and beyond environmental conservation, the *South China Morning Post* reported in 2023 that Sino-Thai collaboration in fundamental science and cutting-edge technology has been strengthened as part of the BRI project. Here China has been influencing Thailand from building smarter artificial intelligence-driven cities to creating more alternatives to fossil fuels.[19] As a result, Sino-Thai BRI cooperation has been expanding, propelling China to become an increasingly indispensable partner for Thailand's environmental and national development.

It is noteworthy that not only does China's BRI scheme focus on green sustainable development, but its major alternatives, such as the European Union (EU)'s European Green Deal has been designed and launched to improve the overall sustainable competitiveness of the EU and partnered countries. Among 180 calculated countries, the Scandinvian countries, led by Sweden, Finland and Denmark, are the most sustainably competitive countries worldwide.[20] In Early 2022, European countries such as France, Germany and Italy formed a Team Europe Initaitve (TEI) for EU-Association of Southeast Asian Nations (ASEAN) connectivity and the EU-ASEAN Green TEL with ASEAN Catalytic Green Finance Facilitiy and encouraged mobility for SEA individuals via the Erasmus+ and Marie Slodowska-Curie Actions programmes.[20] Such initiatives demonstrate signs of ASEAN nations consolidating their ties with EU member states, in order, but not limited, to construct more green partnerships between the 2 regions in the long run. Such partnerships provide ASEAN nations more options for green developmental partnerships, as China's BRI is not the sole major initiative that can help SEA achieve susstainable development. Such a circumstance further indicates why China should speed up its transition to greener BRI, in order to make such a programme remain competitive on the global stage.

In Thailand, the Mekong River has been encountering environmental challenges, such as having a damaging hydropower dam development project, for decades. Existing literature argues the China-backed infrastructure investment in the Mekong River has been reportedly improving the livelihoods of local Thai communities through fishing, agriculture and water supply who rely on the River for everyday life.[21] Such findings indicate how BRI partnerships can generate positive societal and environmental impacts on Thailand's development at both the national and individual levels. However, there are public noises raised by local Thai communities within the Mekong River area, stating that there are environmental concerns inflicted by the 'green' China-backed developmental projects. For example, implementing these projects requires excavating 20 000 tons of rocks. The rocks are deposited in deep pools along the River. However, these deep pools are significant for the livelihoods of the local communities, as they are crucial fish habitats. Local communities urge the Chinese developers to execute the 'green' component of these projects better to alleviate any environmental issues.[22] Such an incident indicates that China has to focus more on pragmatically contributing to the environmental protection of its BRI partner countr(ies), in order to demonstrate that the green BRI is more than just rhetoric.

Thailand's Waste Management and Associated Impacts on Environmental Health

Existing literature argues that environmental health, sustainable development and economic growth are intertwined in Thailand.[23,24] This is in part because the development of a

sustainable and environmentally healthy habitat in Thailand allows for attracting more tourism-related revenues and nurturing the next generations of productive labour force. Therefore, this section delineates the major environmental issues faced by Thailand, in order to suggest why Thailand needs to urgently and responsively address any notable environmental concern for long-term economic growth and sustainability.

Thailand has long been relying on its tourism economy to support the country's national growth. Water sports and recreational activities hosted near coastal areas have attracted millions of foreigners, including Chinese tourists, per year. In 2023, China and Thailand strengthened the bilateral tourism ties, in addition to promoting human resources mobilisation and cultural exchange revitalisation between the 2 countries. Thailand was included among the 20 pilot countries for the resumption of outbound travels from China.[25]

However, existing literature argues that environmental degradation poses a significant threat to this robust sector.[26] In addition to the challenge of clean water scarcity, insufficient waste management stands out as a primary contributor to marine litter in Thailand. Increased consumption and waste production are the direct outcomes of Thailand's fast-paced urbanisation and economic growth. Especially when the Thai government has an absence of an effective waste management infrastructure, a raft of packaging waste, electronic waste and alternative municipal solid waste is generated through product consumption. Thailand also lacks an effective waste collection and classification system, failing to separate and recycle waste in which waste per se is often inappropriately thrown into the open environment and the ocean. Such a practice leads to the entrenched and long-standing societal and environmental issue of water, air and land pollution.[27] Poor solid waste collection and unregulated water disposal practices are causing pollution in both soil and water. If left unaddressed, the unmanaged waste associated with tourism activities is giving rise to a marine litter problem that poses a threat to the Thai ecosystem.[28] According to the *Enhancement and Conservation of National Environmental Quality Act (1992)*, the Ministry of Natural Resources and Environment of Thailand requires the application of an environmental impact assessment for industrial and infrastructural projects.[29] All China-backed infrastructure projects must comply with the *Act* to ensure that China-financed developmental infrastructure can meet Thailand's standard of pollution control.

Chinese private and especially state-owned enterprises have the potential to contribute significantly to solving Thailand's issue of sustainability and eco-friendly waste disposal and management challenges. China has recently demonstrated its interest in and motivation to address(ing) Thailand's waste management problems. It is noteworthy that Thailand has recently drafted a *Sustainable Packaging Act*. Thailand aims to establish a regulatory framework to facilitate waste management.[29] Such a regulatory endeavour may suggest that Thailand may have the disposition to welcome China and other economic partners to invest in waste management projects in Thailand. Here Thailand has rich biomass resources, including wood residue and crop straw. Existing biomass gasification projects have encountered issues such as poor fuel flexibility, low gasification efficiency, high tar content in gas and secondary pollution from tar wastewater. Thailand is facing an urgent need to enhance equipment reliability and operation and maintenance capabilities to curtail investment and operating costs. China's Guangzhou Institute of Energy Conversion of the Chinese Academy of Sciences has, in part, collaborated with Thai universities to build an advanced and highly efficient multi-generation demonstration project based on biomass gasification in Nakhon Phanom in Thailand. Here China aims to help the SEA BRI partner turn waste into wealth and promote biomass energy technological development.[30] This paper explores the track record of China's development finance policies and its environmental partnerships formed since the 2000s. The paper aims to dissect whether China, especially under the BRI's epoch and its shifting policy focus to green development, is motivated to pragmatically establish partnerships with Thailand to help the latter build better waste management systems and more favourable eco-tourism. This paper, with supporting data, suggests how Thailand's sustainable and eco-friendly needs align seamlessly with the evolving priorities of China's BRI, that is growingly emphasising green overseas finance and development.

To date, the Thai sustainable tourism industry is encountering substantial environmental problems of unfavourable water quality and waste management outcomes, diminishing its long-term competitiveness in attracting international green tourists.[31] The absence of improvements in water quality and waste management in the SEA country may result in more international green tourists opting for neighbouring tourist-frequented islands or destinations throughout the region. Such a scenario poses a notable threat to the popularity and competitiveness of the Thai green tourism industry.

Research Aims and Questions

This paper aims to investigate China's attitudes towards global development finance, particularly in the post-launch epoch of the BRI. The exploration seeks to identify the types of environmental projects that China prioritises for funding and collaboration, with a specific focus on SEA. By examining the trajectory of China's investment in overseas environmental projects, the paper aims to analyse the feasibility of Sino–Thai partnerships in developing an improved waste management system in the latter country. Furthermore, the paper assesses the funding amounts that China has invested in Thailand's environmental health, enhancing the understanding of China's preferences for overseas development finance in the context of Thailand's environmental health

and sustainability. The research questions for this project are designed as follows:

- How have China's attitudes towards global development finance for environmental health projects evolved since the 2000s?
- What is the trajectory of China's attitudes regarding global development finance to support Thailand's development of improved environmental health?
- Has China demonstrated a strong willingness to invest in Thailand's environmental health enhancement projects compared to that in neighbouring SEA countries?

Methodologies

AidData, established in 2009 in Virginia, meticulously documents and presents details of development finance activities from numerous official aid donors. The AidData portal provides access to development finance activities from 1945 to the present, encompassing data from no fewer than 95 donor agencies. The AidData programme facilitates geopolitical access to information regarding the scales, funding amounts, years and trajectories of global development finance activities. The website china.aiddata.org, initiated and operated by AidData, serves as an online platform to disseminate information about Chinese development finance flows globally, both before and after the establishment of the BRI.

As of the end of 2021, china.aiddata.org has recorded a total of 17 956 global Chinese development finance projects, amounting to a sum of US$1.34 trillion. Utilising the search engine, the researcher narrowed down the recipients of Chinese development finance to the Asian region. Subsequently, the researcher conducted separate searches for the keywords 'eco-tourism' and 'waste management'. According to the records, there were 3 Chinese-funded eco-tourism projects in SEA, with a combined value of US$253.11 million.

China has had a track record of implementing a total of 12 bilateral or multilateral projects aimed at financing waste management initiatives in Southeast and South Asia, with a cumulative cost of US$274.23 million.[32] In the 2000s, China initially supported only 2 relevant projects. However, between 2013 and 2019, China doubled the number of green investment projects in waste management across the region. Notably, in 2021 alone, China funded a total of 5 waste management projects within Southeast and South Asia.[32] It is crucial to emphasise that, at the time of writing this paper, only China's development finance data recorded by the end of 2021 has been made publicly available. This data suggests that China has demonstrated exponential growth in its investment focus on waste management projects across Southeast and South Asia.

Nearly all the recipients of Chinese funding in the search outcomes belong to SEA or South Asian countries. This paper exclusively focuses on SEA recipients of Chinese funding, aiming to dissect how often Thailand received development finance support from Chinese private enterprises or SoEs compared to their neighbouring countries within the region. The paper studies the trajectory of the recipients of Chinese funding on environmental projects, coupled with the corresponding funding amounts, to suggest if China has displayed a growing interest in and willingness to finance green development projects in SEA, especially in Thailand.

Furthermore, this paper examines all supporting materials and background information concerning each relevant funded green development project, as such details are available on china.aiddata.org. The paper presents any highlighted details in the form of qualitative data, supporting the exploration of China's shift to greener BRI and Thailand's waste management. All displayed relevant Asian recipients of Chinese-funded eco-tourism and waste management projects were committed from 2005 to 2021, with the commitment years of the majority of initiatives marked in the post-BRI epoch (ie, September 2013). Such data align with the aforementioned argument that the incorporation of green concepts has been emerging contemporarily, and most green development initiatives were not introduced and launched until a later stage of the implementation of the BRI.

Findings

There is a lack, if not an absence, of existing studies that analyse Sino-Thai green BRI partnerships with the presentation of supporting, updated data and statistics. The findings presented in this section respond to such a research gap and allow readers to understand, from a macro-perspective, how China has been providing green development finance to Thailand for the latter's environmental conservation and development in recent years. The findings presented enrich the novelty and significance of relevant, existing intellectual understanding.

By the end of 2021, China had funded 3 green development projects aimed at promoting eco-tourism in Southeast and South Asia. The first project was committed on January 1 2005, with a total value of US$542 560. The project was successfully completed on November 29 2010. The funding constituted a donation to the United Nations Development Programme for the 'Development of Sustainable Eco-Tourism in the Southern Districts of Thailand' project, providing financial support for the 2005 recovery plan for individuals and entities affected by the 2004 Indian Ocean Tsunami. This project played a pivotal role in diversifying tourism opportunities in Southern Thailand by incorporating eco-tourism. It achieved this through initiatives such as capacity building to facilitate small tourism businesses in the sustainable management of eco-tourism. Moreover, the project contributed to raising media awareness to underpin the significance of maintaining an eco-friendly tourism industry.[33] An example of eco-tourism policies Thailand has been upholding is the supply of green hotel services. Here Thai travel agents and destination management companies have been promoting green hotels to international

visitors by creating preferred lists of tourism suppliers who meet environmentally friendly criteria. Thailand has been issuing green hotel certifications to qualified establishments in order to attract more eco-tourists.[34] Since the 1990s, Thailand, including Southern Thailand, has been promoting community-based tourism, meaning tourism per se is organised, arranged and delivered by local Thai citizens to serve the visitors. Such community-based tourism is one of the prevailing solutions for Thailand's sustainable tourism because local citizens serving travellers have been able to benefit directly financially and occupationally from the influx of visitors.[35] These policies and strategies have all signalled Thailand's development of sustainable eco-tourism.

Another completed China-financed green development project aimed at advancing eco-tourism was the provision of support worth US$397 600 from the Lancang-Mekong Cooperation Special Fund. This financial support was dedicated to poverty alleviation and forest preservation in Northeast Thailand, and the project was commissioned on December 24 2019. As part of the project, over 20 000 tree seedlings had been planted by the end of 2021, contributing to the establishment of sustainable eco-tourism and a forest economy in Northern Thailand. These 2 Chinese development finance projects, in addition to another initiative benefitting Sri Lanka to build an international airport starting in 2010, were the only pro-eco-tourism projects in Asia that China had funded as of December 31 2021.[33]

China has additionally funded a total of 12 waste management projects in Asia spanning from 2006 to 2021. The primary recipients of this development finance were SEA and South Asian countries. Half of the beneficiaries of these projects were SEA countries, specifically the Philippines, Cambodia, Laos, Myanmar, Timor-Leste, and Malaysia. An additional 5 Chinese-funded development finance projects on waste management were allocated to Nepal, Maldives and Sri Lanka. The remaining project was implemented in Central Asia.[33] Among these 10 funding recipients, Maldives and Sri Lanka received loans twice. Collectively, these 12 projects amounted to a total of US$274.23 million. As many as 5 projects were commissioned in 2021 alone, with a total value of US$4.16 million. Importantly, among these 5 projects, 4 out of 5 times the recipients were SEA countries, namely the Philippines, Cambodia, Laos and Myanmar. Additionally, between 2013 and 2020, 4 projects worth a total of US$201.34 were commissioned, with recipients including Timor-Leste and Malaysia. It is noteworthy that the aforementioned Sino-Thai technological and innovative collaboration on Thailand's waste management is a recent, ongoing BRI project.[30] Given China's development finance data in or after 2022 have yet to be made available publicly, such an ongoing project is not searchable during data collection.

Among the 6 Chinese development finance projects on waste management displayed in the search engine results for SEA, 5 directly funded waste management campaigns. Notably, all these 5 projects were funded in the form of grants. However, the remaining project (with Malaysia as the recipient) was aimed at building and maintaining gas-fired power plants and was funded in the form of loans. This data suggests that not only were Chinese private enterprises and SoEs more willing to fund SEA's waste management projects in recent years, but the fundings directly contributed to building and expanding waste management campaigns within the region were all grants rather than loans. Consequently, SEA countries, at least solely from a financial perspective, were not burdened with any debt related to these initiatives.

Discussions

How have China's attitudes toward global development finance for environmental health projects evolved since the 2000s?

According to the data examined in this paper, Chinese development finance projects in Asia failed to incorporate green concepts until 2005. In the 2000s, only a handful of Chinese development finance projects focussed on green development in Asia were commissioned. Since 2013, the year marking the implementation of China's BRI, the number of Chinese development finance projects on green development, specifically centred on building or maintaining eco-tourism and promoting waste management campaigns, has surged. In 2021 alone, these numbers peaked. Examining the trajectories of Chinese development finance projects, this paper reveals China's enhanced commitment to green development over time, particularly in the most recent years. As discussed above, green concepts emerged in Thailand as early as in the 1990s. However, by then, China had yet to developmentally finance Thailand to build bilateral ties on the promotion of Thailand's green development. As green concepts have been rapidly popularised, since the 2000s, especially in recent years, a surge of Sino-Thai collaborative projects on green development has been delivered.

However, when focussing on the amount of funding each project received, there is no indication that Chinese private enterprises and SoEs invested more financially in advancing eco-tourism and waste management in SEA over time. Each funding amount was determined by the nature of the corresponding project, with initiatives involving large-scale humanitarian aid and/or extensive infrastructure development endeavours being more costly. Moreover, it is reasonable to expect that loan projects would typically be subject to substantially larger funding amounts in US$ than their grant counterparts.

What is the trajectory of China's attitudes regarding global development finance to support Thailand's development of improved environmental health?

Overall, in comparison to South Asian countries, Chinese private enterprises and SoEs have demonstrated a relatively stronger interest in funding green projects in SEA. By the

end of 2021, all existing or completed Sino-Thai green projects were dedicated to building and sustaining the Thai ecotourism industry. Given the societal and environmental significance and urgency for Thailand to address waste and water management, it is highly likely that future Chinese development finance to Thailand will contribute to enhancing the country's capacity for better managing domestic waste and water quality.

As discussed in the preceding sections, Thailand's ability to handle tasks such as garbage disposal and recycling is crucial for the long-term prosperity of sustainable tourism development. Therefore, while Chinese development finance, as of the end of 2021, had primarily focussed on advancing Thailand's eco-tourism rather than waste management, both development responsibilities are highly interconnected and cannot be separated. Hence, the data suggests that China has shown a willingness to support Thailand's development of improved environmental health. There is no indication that China's intention in this regard will halt in the near future. With, as mentioned above, China and Thailand have strengthened their bilateral tourism ties along with boosting human resources exchange, China may, in the long term, develop more incentives to establish Sino-Thai BRI cooperation on boosting Thailand's eco-tourism development. Any investigation of such a topic entails the availability of more up-to-date China's overseas development finance data, so such an exploration may be followed up in any upcoming research project.

Has China demonstrated a willingness to invest in Thailand's environmental health enhancement projects compared to those in neighbouring SEA countries?

Among all SEA green projects studied in this paper, evidence suggests that China has evenly invested in the region, with no specific country being disproportionately the major recipient of Chinese development finance support. Therefore, this paper cannot conclude that China has particularly been willing to invest in Thailand's green initiatives compared to other neighbouring SEA countries. However, it is found that SEA countries have been the primary beneficiaries of Chinese development finance policies within Asia as a whole. While China has shown some levels of interest in funding South Asian countries, including the Maldives and Sri Lanka, by the end of 2021, the financial support often comes in the form of loans. In contrast, China has provided a growing amount of grants to SEA countries to assist the region in building and sustaining green development.

Conclusions and Limitations

China's sustained overseas investment in Thailand's ecotourism development and environmental protection serves a dual purpose. It not only assists Thailand in enhancing the competitiveness of its domestic tourism economy but also contributes to China's shift towards greener overseas development finance policies. This paper presents scholarly arguments on China's transition towards a green BRI policy focus, with the presented data supporting such a belief. As China continues to move away from conventional, environmentally harmful large-scale infrastructure construction to green development that favours the ecosystems of the developing world, Thailand, which is in a position that requires seeking domestic or overseas finance, can negotiate with China to build more Sino-Thai partnerships conducive to the SEA country's enhancement in eco-friendly growth.

The provision of grants to Thailand's green development is a strategic approach for China to alleviate its long-standing concerns about the environmental risks associated with development. This strategy supports China's promotion and expansion of its BRI in the long term, as global doubts about the environmental consequences of participating in the initiative diminish. Should China's distribution of development finance to Thailand be able to enhance the latter's environmental health and landscape, more SEA and global emerging powers may develop an increasing interest in forming or strengthening green BRI partnerships with China. In the long run, such an optimistic outcome allows China's diplomatic influence to grow further. China's greener development finance plan is an ambitious, globally impactful strategy. Such an ambitious strategy aims to capitalise on the opportunities to address countries' developmental and environmental needs to boost China's global competence and image, in addition to elevating its diplomatic influence.

It is noteworthy that China launched the Green Investment Principles for the BRI in late 2018, delivering a clearer framework for greener BRI investments in partner countries. However, not until in mid-2021 did China issue the *Green Development Guidelines for Overseas Investment and Cooperation* and the *Guidelines for Ecological and Environmental Protection of Foreign Investment Cooperation and Construction Projects*. These Guidelines focus on managing environmental risks associated with overseas BRI projects and supply chains, aiming to build more sustainable development in BRI partner countries.[36] However, given that these Guidelines were issued in mid-2021 while research data analysed in this paper were only updated until the end of the same year, very likely this project fails to evaluate how greener BRI development has been launched upon the publication of these Guidelines. A follow-up research project should be developed to further evaluate the environmental health of Thailand under the close Sino-Thai BRI ties once more updated data are made available in due course.

Despite the values of novelty and significance added to the existing intellectual understanding, this paper is exposed to a few limitations. First, as mentioned in the preceding paragraph, the secondary dataset this paper focuses on for data analysis

only contains data published by the end of 2021. Until more updated data are released, researchers and readers fail to locate more recent China's development finance projects, especially those initiated in the post-pandemic epoch. Second, this paper exclusively addresses Thailand's environmental sustainability. If any researcher plans to develop a methodologically similar but contextually more extensive research project, they should be advised to comparatively analyse China's development finance to Thailand's and neighbouring countries' environmental protection and development. Such a comparative analysis allows a more comprehensive understanding of the environmental and developmental impacts of China's green BRI strategy. Third, large-scale projects, especially those at the national and global levels, have been publicly recorded and archived, allowing data analysts to carry out research investigations. However, there may be small-scale environmental conservation projects developed and delivered at the local and community levels that have not been publicly recorded and archived. As a result, secondarily analysing publicly visible and accessible datasets may underestimate the actual environmental impacts delivered by China-backed infrastructure development projects.

Research Ethics and Patient Consent

This research did not collect any data from human subjects, as all data collected and analysed was secondary.

ORCID iD

Jason Hung https://orcid.org/0000-0002-0267-3925

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