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UNDER THE BELT AND ROAD INITIATIVE (BRI), CHINA'S GREEN INVESTMENTS IN AFRICAN COUNTRIES

Yunxin CHANG
İstanbul Ticaret University, Turkiye

Yunus ÖZCAN
İstanbul Ticaret University, Turkiye

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Abstract:
The Belt and Road Initiative (BRI) has been growing its economic impact on all over the world since the declaration of Chinese President Xi Jinping in 2013. This initiative had been considered as a highly ambitious global initiative aimed at stimulating economic growth across Europe, Asia, and Africa. As of February 2025, there are 152 countries involved in the BRI initiative and a considerable number of African countries also take part in this initiative to be able to foster their economic condition along with this giant economic movement. To investigate the effects of China's BRI investments in African countries with an environmental approach, this study examines China's green investments in African countries between 2013 and 2023, by using data from the China Global Investment Tracker, and employing descriptive statistical analysis. Focusing on 21 African BRI countries, green BRI investments from aspects of yearly trend, country distribution and sector allocation are analyzed. In the process of separating BRI investment records into green and non-green categories, it is found that green investments have grown rapidly around world over the decade, compared to non-green ones. The findings also indicate the recent years have witnessed an annual stabilization of 30% green investment. These green investments demonstrate a strategic emphasis on "resource acquisition and infrastructure building" with investments concentrated in resource-rich countries to secure essential minerals such as lithium and uranium, while simultaneously developing clean energy projects and infrastructure. Therefore, while these investments can foster sustainable development in African countries, they also pose environmental risks through mining investments, which require robust environmental assessments and governance to avoid Pollution Heaven problems.

Keywords:
Belt and Road Initiative (BRI), World Economy, China's Green Investments, African Economies

JEL Codes:
F15, F18, F21

1. Introduction

The Belt and Road Initiative (here after BRI) is a strategic global initiative aimed at fostering collaborations between China and the countries along its route. As released on the Belt and Road Portal of the government website, a total of 152 countries, excluding China itself, are participating in the BRI Initiative, as defined by the signing of the Memorandum of Understanding (MoU) with China. Other bilateral cooperation agreements between China and BRI participating countries are contingent upon the existence of mutually signed documents (Wang, 2022). These countries are distributed globally, encompassing Asia, Europe, Africa, North America, South America, and Oceania. Apparently, most of Asian and African countries have joined the BRI, and some of Middle and South America have become part of the BRI. Overall, it is observed that the majority of BRI participating countries are developing countries in which there exists substantial opportunities for social and economic development. So, this article focuses on studying the BRI's economic activities in especially developing African countries.

The primary objectives of the BRI are promotion of shared prosperity, peace, mutual understanding, enhanced friendship, and trust (Huang, 2016). The overarching structure of the BRI encompasses a significant vision, three prominently emphasized principles, five distinct objectives, six modes of transportation, and six economic corridors.

The BRI is characterized by a visionary goal of establishing an international community that shares common interests, destiny, and responsibilities (Zhai, 2018). The BRI is grounded in the conceptual principles of peaceful cooperation, openness, inclusivity, and mutual learning and benefit. A set of five significant objectives are formed, namely: unhindered trade, the advancement of infrastructure, political discourse, financial integration, and fostering interpersonal connections. In the context of infrastructure development, significant emphasis is placed on six distinct modes of transportation, namely highway, railway, maritime, aviation, pipeline, and space integrated information network (Belt and Road Portal, 2023). Regarding the geographical distribution of roads under BRI, it is worth noting that it has six distinct economic corridors, in addition to the prominent Silk Road Economic Belt and Maritime Silk Road, including New Eurasian Land Bridge, China-Mongolia-Russia Corridor, China-Central Asia-West Asia Corridor, China-Indochina Peninsula Corridor, Bangladesh- China-Myanmar Corridor, China Pakistan Corridor.

Despite encountering numerous challenges during the implementation phase, the BRI has made some significant progress. In terms of policy connectivity, China has established communication mechanisms and policy coordination with other participating countries. For example, China has organized the Belt and Road Forum for international cooperation on four occasions respectively in the year of 2013, 2017, 2019 and 2023. This collective engagement resulted in the formulation of over 1000 tangible BRI cooperative measures (Xinhua News, 2023). Besides, infrastructure connectivity is highly valued for participating countries and improved a lot over the last years. For instance, the Western Europe-Western China (WE-WC) Highway, spanning 8445 kilometers from Lianyungang to St. Petersburg, marked a significant milestone in the development of the across-national infrastructures in 2018 after a decade of construction (Kazakh Invest, 2020). In the trade and commerce area, the proportion of commerce between China and BRI countries over China's total foreign trade has rising by 6% and reaching 45% in 2022. Moreover, in terms of financing, there is a growing collaboration between transnational banks and organizations, for example, the China-Central and Eastern Europe Interbank Consortium, the China-Africa Interbank Association, and the China-Arab Countries Interbank Association (Xinhua News, 2023).

However, considering our earth is facing significant challenges pertaining to an impaired environmental system and climate change, the BRI, as a massive global economic initiative, is not an exception of resulting in some environmental effect because it can lead to growing human activities. To mitigate BRI projects' potential negative environmental consequences, China has came up with the notion of "Green BRI" as a mean to achieve sustainable economic development through BRI platform. The official concept of "Green BRI" was illustrated in the two key documents "Ecological Environmental Protection Cooperation Plan for BRI" and "Guidelines on Promoting Green Belt and Road," published in 2017. Importantly, through proposing the "Green BRI" at the 2017 Belt and Road Forum, China officially positioned the "Green Silk Road" as a core pillar of BRI cooperation.

In this article, firstly a detailed analysis of the background of the Belt and Road Initiative (BRI) is given. China's global Outward Foreign Direct Investments (OFDI) are examined since the beginning of BRI and China's green investments in African developing countries are studied. Based on collected data from the database of "China Global Investment Tracker" the detailed sector and project content information of BRI investments for green classification are analyzed to reveal the characteristics of China's green BRI investments in African countries. This study thus tries to contribute to the current literature by enhancing our understanding of the current green BRI development status and trends, providing reasonable recommendations for policymakers to better leverage green BRI in global environmental governance.

2. Belt and Road Initiative (BRI)

The current BRI has its historical origins in the ancient Silk Road, which is a significant historical route connecting Western and Eastern civilizations for nearly two millennia, serving as the foundational precursor to the present-day BRI. The archaeological evidence pertaining to silk artifacts discovered in Central Asia, originally coming from the agricultural civilization of East Asia, exquisitely indicates that sporadic and dispersed trade activities took place in the steppe regions as early as the 10th century BC (Liu, 2010). During the Han dynasty in China (202 BC - AD 220), the ruler, aiming to defense against the north nomadic Xiongnu tribes, dispatched a national ambassador named "Zhang Xian" to visit the neighboring kingdoms in central and western Asia (Hansen, 2012). The objective was to establish alliances with other kingdoms and obtain robust horses for military purposes in Han dynasty (Benjamin, 2018). According to Millward (2013), the Ferghana horses were frequently brought by Han in a significant amount. As trading exchanges, a great quantity of silk was also sent to the regions of Middle and West Asia in return for horses.

The route spanned several geographical continents, including the Qinghai-Tibet Plateau in Tibet, the Pamir Plateau, the Iranian Plateau, the Anatolia regions, and extensive desert areas. Especially in the desert, the Silk Road witnessed a substantial presence of camels because camels can endure extreme long journeys and have resilience in the face of drought conditions. Over millennia, the route is not only services as a vital commerce corridor but also functioned to exchange cultures, technologies and faiths. For instance, the introduction of Christianity and Buddhism to China and the China's printing technology dissemination in Europe are notable cases (Foltz, 1999).

During the 15th century, with the decline of the Roman Empire, the Ottoman Empire and the Mongol Empire were on the rise, causing unremitting wars and conflicts that interrupt trades along the Silk Road (Jeong, 2016; Biran, Brack, & Fiaschetti, 2020). In subsequent periods, there was a remarkable advance in shipbuilding technique, which led to a significant growth in maritime trade. An example was that Zheng He in the Ming dynasty of China undertook the maritime expeditions, commencing in 1405. These journeys open the subsequent trading see routes reaching to South Asia, Malaysia, the Arabic region, and East Africa (Nolan, 2015). Furthermore, a Spanish navigator Christopher Columbus, started on his transatlantic voyage in 1492, ultimately leading to the discovery of the new continent of America. The substitution of the land silk route by the maritime road has been partly attributed to the relatively lower cost of shipbuilding and maritime trading. Despite disruptions of the Silk Road due to continuous regional conflicts and global wars, the route's fundamental principles of peaceful collaboration, openness, and mutual learning and benefits have become a long-lasting and significant legacy of human civilization.

Back to the present, by 2013, China has experienced a considerable development in its economic prowess, becoming the second largest global economy in terms of total GDP, following the United States. Also, China possesses a substantial volume of foreign exchange reserves, estimated at approximately 3.82 trillion USD in the year of 2013, reaching the peak of 8.84 trillion in 2014 (State Administration of Foreign Exchange, 2018). As an emerging economy, China intends to twist the global framework toward a more favorable playground beneficial to developing nations in the geopolitical sense (Gu et al., 2008).

According to Swaine (2015), the proposed BRI can serve as a strategic approach for China to utilize its economic power and expand its influence. Based on the distribution of BRI participating countries, the below table shows the countries joined the BRI and the numbers of BRI nations in each single region. This includes 52 countries in Africa, 40 in Asia, 26 in Europe, 12 in North America, 12 in Oceania, and 10 in South America. Notably, the initial regions supporting the BRI were Asia and Europe. The first batch of BRI participating countries in 2014 are Kazakhstan, Belarus, Qatar, and Sri Lanka (Yazdani, 2020). Besides, that Italy officially exited the BRI in November 2023 and Panama left the BRI in February 2025.

From an economic perspective, BRI countries are experiencing different development stages and unique historical backgrounds, leading to distinct economic conditions. According to data from the World Bank and the Green Finance and Development Center, the income levels of BRI countries vary vastly. Table 1 provides information for BRI countries in terms of income classification and geographic region.

The distribution of BRI countries across income levels is as follows: 22% are high-income nations, 21% are low-income nations, and the majority are middle-income nations with 57%, including 29% upper-middle-income countries and 28% lower-middle-income countries. Notably, most low-income countries are in Africa and Asia, while most high-income countries are in Europe. This indicates that approximately 80% of BRI countries are still developing countries that are in demand of more economic support to build their infrastructure development and promote their international trade.

Regarding environmental characteristics, many BRI countries are facing various environmental challenges due to their ecologically fragile and complex environmental conditions. Due to the diverse climate characteristics, natural disasters could frequently occur, such as recurrent droughts in Central Asia and the Middle East regions, typhoons, and floods in regions of East and Southeast Asia during the monsoon season. Besides climate-induced disasters, some BRI countries, especially those located along seismic zones like Central Asia, the Himalayas, and parts of Europe, may be susceptible to earthquakes.

According to the planetary boundary theory, our Earth's ecosystem possesses an inherent capacity to spontaneously restore ecological equilibrium by utilizing its natural resources, even in the face of disruptions caused by human activities (Teo et al., 2019). However, when disruptions exceed the ecosystem's limited boundary, it would cause irreversible damage which posts a threat to human living environment. BRI projects, considering their scale and intensity, are significant interventions in ecological systems.

Table 1: BRI Countries by Income and Geographical Region

BRI Regions	Income Level	Number of the BRI countries	BRI Member States
Africa	High income	1	Seychelles
	Upper middle income	7	South Africa, Algeria, Gabon, Libya, Namibia, Equatorial Guinea, Botswana
	Lower middle income	17	Cameroon, Egypt, Arab Rep., Côte d'Ivoire, Kenya, Morocco, Angola, Cabo Verde, Djibouti, Ghana, Mauritania, Nigeria, Sudan, Tunisia, Zambia, Lesotho, Congo, The Democratic Republic of Sao Tome and Principe
	Low income	27	Comoros, Somalia, Madagascar, Ethiopia, Benin, Burundi, Chad, Togo, Gambia, Guinea, Zimbabwe, Rwanda, Mozambique, South Sudan, Sierra Leone, Senegal, Tanzania, Uganda, Liberia, Mali, Eritrea, Congo Dem, Guinea-Bissau, Niger, Central African Republic, Burkina Faso, Malawi
Asia	High income	9	United Arab Emirates, Oman, Bahrain, Korea, Kuwait, Saudi Arabia, Brunei Darussalam, Singapore, Qatar
	Upper middle income	12	China, Thailand, Azerbaijan, Kazakhstan, Turkey, Armenia, Iraq, Lebanon, Maldives, Malaysia, Turkmenistan, Iran Islamic Rep.
	Lower middle income	15	Pakistan, Kyrgyz Republic, Cambodia, Mongolia, Uzbekistan, Indonesia, Georgia, Myanmar, Timor-Leste, Philippines, Sri Lanka, Vietnam, Lao PDR, Bangladesh, Palestine
	Low income	5	Nepal, Yemen, Rep., Tajikistan, Syrian Arab Republic, Afghanistan
Europe	High income	15	Austria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Slovak Republic, Slovenia
	Upper middle income	9	Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Montenegro, North Macedonia, Romania, Russian Federation, Serbia
	Lower middle income	2	Moldova, Ukraine
North America	High income	4	Antigua and Barbuda, Barbados, Panama, Trinidad and Tobago
	Upper middle income	6	Costa Rica, Cuba, Dominican Republic, Dominica, Grenada, Jamaica
	Lower middle income	3	El Salvador, Nicaragua, Honduras
Oceania	High income	1	New Zealand
	Upper middle income	4	Cook Islands, Fiji, Samoa, Tonga
	Lower middle income	6	Kiribati, Micronesia Fed. Sts, Niue, Papua New Guinea, Solomon Islands, Vanuatu
South America	High income	3	Argentina, Chile, Uruguay
	Upper middle income	5	Ecuador, Guyana, Peru, Suriname, Venezuela RB
	Lower middle income	1	Bolivia

Source: Belt and Road Portal and Green Finance & Development Center

3. China's Green Investment over the World

As a pivotal driver of BRI implementation, China's Outward Foreign Direct Investment (OFDI) serve as a critical yet under-explored nexus for understanding BRI potential influence over environment of participating countries. By breaking down the collected OFDI data from the National Bureau of Statistics of China, we can analyze investment

industries and destined countries. Classifying investment projects into green and non-green categories based on limited information poses a challenge for numerous studies, and ours is no exception. As the most widely applied and influential green classification standard, the EU Taxonomy framework is adopted to categorize our BRI investment data. Considering the sector and project content information, if a BRI investment is aligned with the purpose of six objectives of EU Taxonomy, it will be classified as green BRI, otherwise, it is classified into non-green BRI investments. Eventually, 400 significant investment projects directed towards 45 BRI countries into green and non-green investment projects over 2013 to 2023 are categorized. These projects are depicted in Table 2 from 2013 to 2023.

Table 2: The Nature of BRI Investments

Year	Total Projects	Non-Green Projects	Green Projects	Percent
2013	9	7	2	22%
2014	30	22	8	27%
2015	45	36	9	20%
2016	28	20	8	29%
2017	30	24	6	20%
2018	48	43	5	10%
2019	49	38	11	22%
2020	28	22	6	21%
2021	34	24	10	29%
2022	37	22	15	41%
2023	62	35	27	44%

Source: China Global Investment Tracker

Based on the number of categorized projects, it is observable that since 2013, the quantity of significant BRI investment projects, regardless of being green or non-green, has been increasing annually. Between 2013 and 2021, the proportion of green projects fluctuated between 10% and 30%. This proportion experienced growth and stabilized around 40% from 2021 to 2023. For distribution of sector, Nedopil (2025) points out that by a significant portion of these investments is concentrated in technology, manufacturing, as well as metal mining to support the substantial expansion of renewable energy transitions such as solar PV, electric batteries can vehicle.

Figure 1 provides information for the sectors/industries of investments for the period 2013-2023. In 2007, China's outward direct investment was predominantly allocated to wholesale and retail trade, leasing, and business services, with significant investments in transportation, mining, and manufacturing. After 16 years, in 2023, wholesale and retail trade, leasing, and business services are still dominating the leading position. Notably, this classification is made by Chinese governance with a broad scope of leasing and business services. But investment amounts in some sectors are increasing. For example, manufacturing has expanded to the third place of all industries. Scientific research, technical services and geological exploration also move up to the higher tank, followed by the financing industry (4th place), the mining industry (5th place), and transportation warehousing and postal services (6th place).

As for the destinations of investments, Figure 2 shows changes in data between 2007 and 2021. A shifting pattern the changing trend can be easily drawn from the figure. First of all, for 14 years, the top 3 countries have consistently been Hong Kong, China; the British Virgin Islands; and the Cayman Islands, all of which are known for international havens for tax, financing, and international trade. Apart from these countries, the other top 11 independent countries receiving the most Chinese OFDI are listed in the line figure 20. It is observed that in 2007, Canada, the United Kingdom, and Australia were the top 3 most popular destinations of China's OFDI, with Canada as the first place received 1.03 billion USD. However, China's OFDI flowing to Singapore reached its peak in 2015 and remained the leading country in 2021. Later in 2016, China's OFDI flowing to the United States peaked and remained the top 2 destinations in 2021. This underscores Therefore, Singapore and the US play a significant role in China's global investment environment. Notably, it is evident that Indonesia experienced a remarkable increase in receiving Chinese OFDI, growing from 0.099 billion USD in 2007 to 4.37 billion USD in 2021, becoming the 3rd place of investing destinations. A similar situation also happened in Viet Nam with 5th place in China's OFDI. Conversely, Australia and the United Kingdom have witnessed a rapid decline of investments, only ranking 6th and 7th places. These

dynamic changes highlight that China's OFDI destinations are experiencing notable shifts towards Asian countries, with significant investment growth in Southeast Asia, particularly in Indonesia and Vietnam.

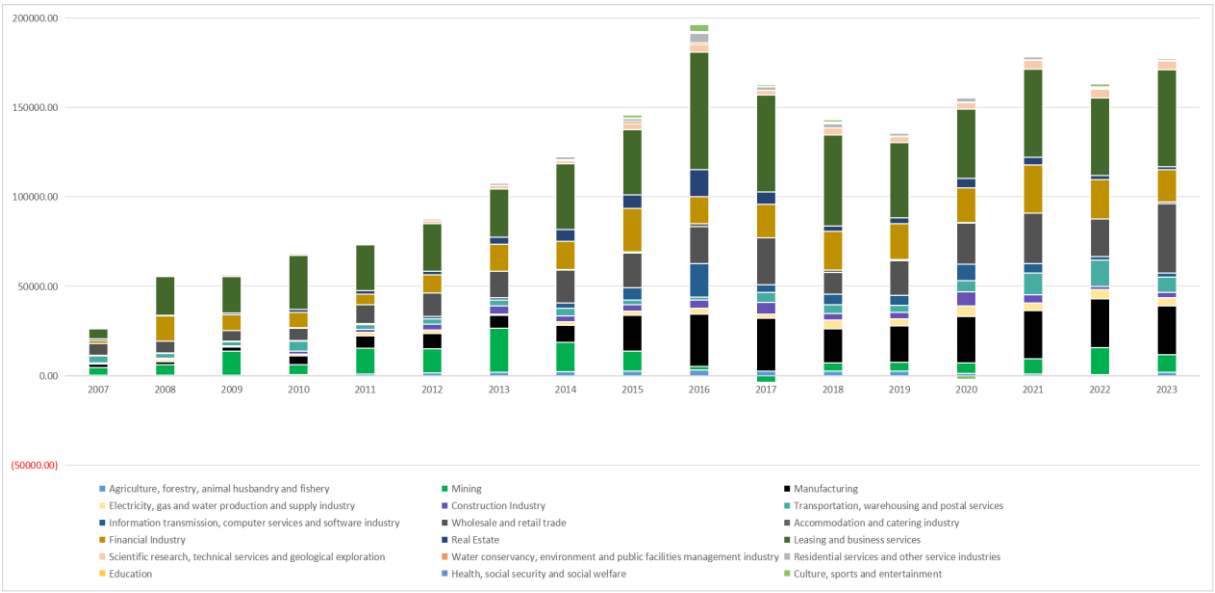

Figure 1: China's Outward FDI Flows by Sectors (2007-2023, Million USD)
Source: National Bureau of Statistics of China

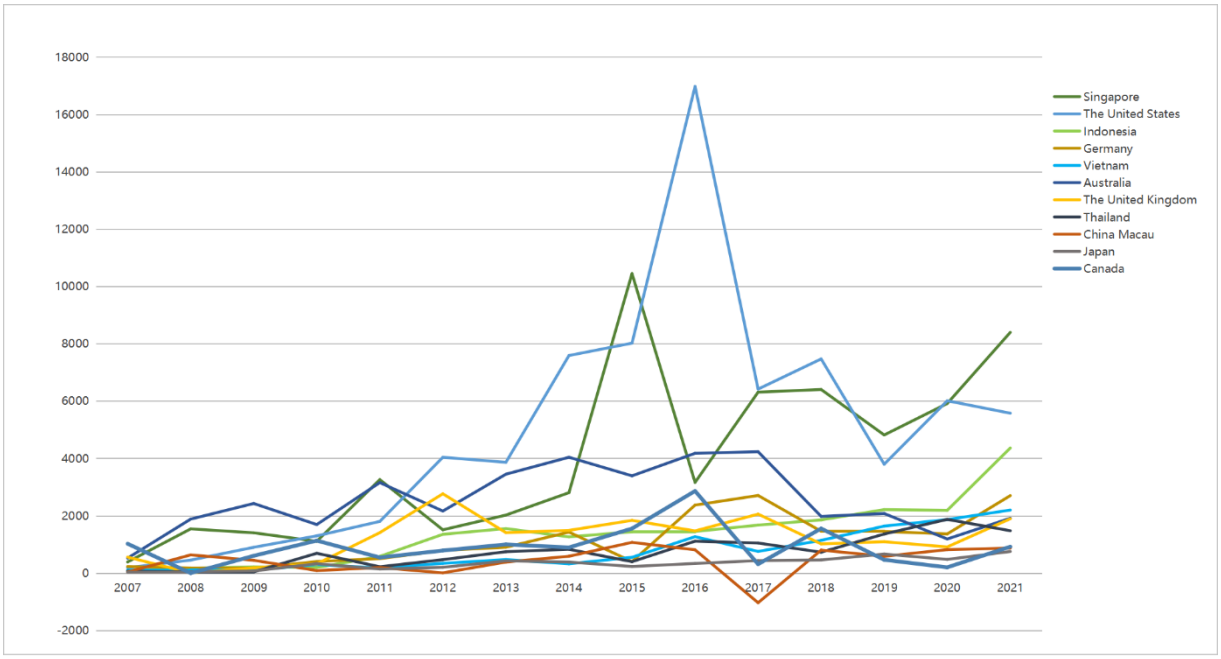

Figure 2: China's Outward FDI Flows by Destination (2007-2021, Million USD)
Source: National Bureau of Statistics of China

To further examine China's OFDI in BRI countries, detailed information on each individual investment project is required. Given the data availability, this study employs the database in the China Global Investment Tracker website, which records and aggregates data of large Chinese investment projects (more than $100 million USD), presenting their crucial elements such as the investing entities (Chinese enterprises), receiving nations, investment dates, sectors, and investment amounts. This database is carefully made by the American Enterprise Institute and accessible to the public, being the most available and comprehensive resource of academic research (Shao, 2020). The studying time window spans from September 2013 to December 2023. Notable, it must be acknowledged that this database does not represent all of China's overseas investment projects due to only BRI projects higher than100 million USD are included. But it still greatly helps us understand the BRI global investments in the detailed project level.

4. China's Green Investment in African Countries

Using the same classification method, 99 BRI investment projects across 21 African countries from 2013 to 2023 into green and non-green investments are categorized. It is found that 22 of these investments were green, accounting for 22% of the total investment amount. The line graph represents the annual proportion of green investments, the blue bar chart shows the total annual investment amount, and the green bar chart indicates the annual amount of green investments.

As shown in the Figure 3, the total BRI investment by China in 21 African countries has fluctuated over time, peaking at 6.95 billion USD in 2014. The amount and proportion of green investments varied significantly. The highest green investment amount reached 2.77 billion USD in 2014. The proportion of green investments reached 100% in 2017, because the total investment this year was relatively low and entirely in green sectors. In recent years, the proportion of green investments has stabilized at around 30% since 2021. By 2023, while China's BRI green investment amount in Africa remains significantly lower than non-green investments, the around 30% green investments in recent years suggests that a slowly undergoing transition and some extent of sustainability in Africa.

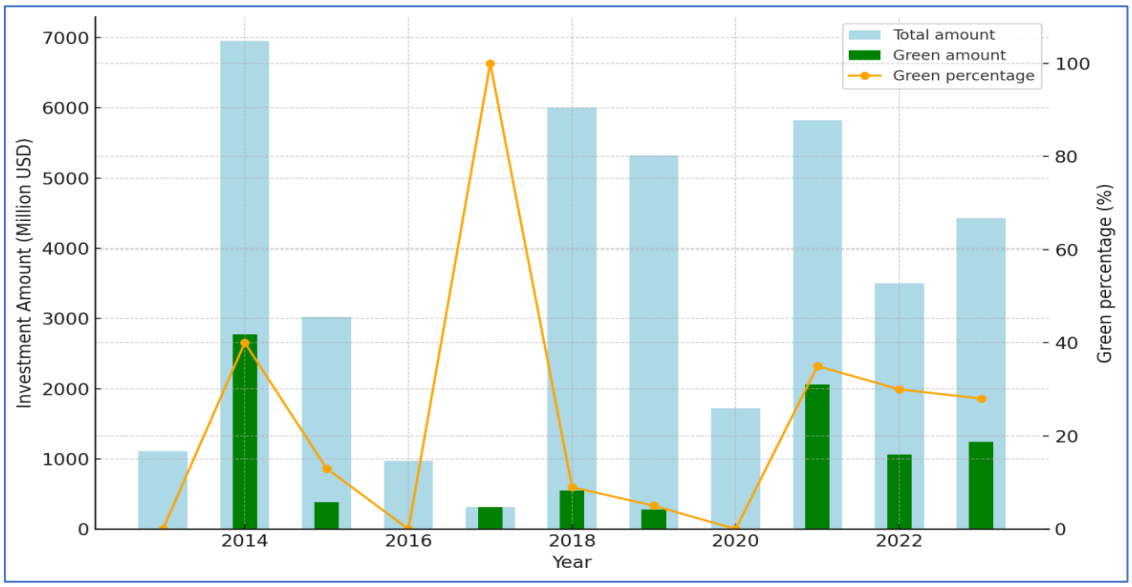

Figure 3: China's BRI Investment in Africa Countries Over 2013-2023

Source: Author's own calculations based on data retrieved from the database China Global Investment Tracker

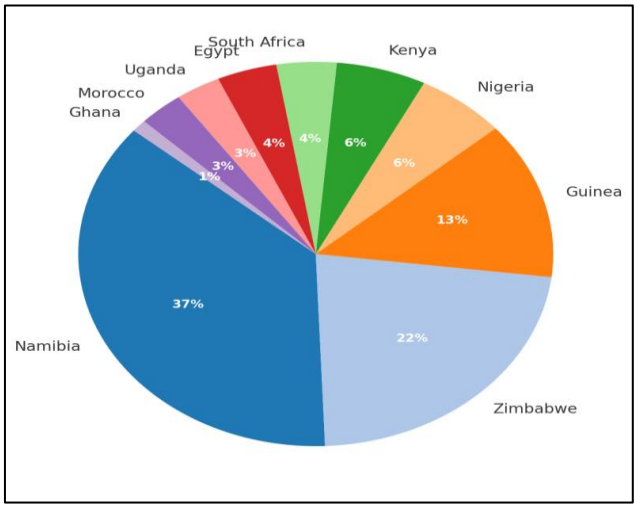

Figure 4: Distribution of China's Green BRI investments in Africa by Countries
Source: China Global Investment Tracker

To better analyze the distribution of green BRI investments, Figure 4 illustrates the distribution of the 8.65 billion USD in green investments across African countries from 2013 to 2023. As indicated in the pie chart, China's 8.65 billion USD of green BRI investments is highly concentrated. Namibia alone accounts for 36%, primarily in the mineral and metal sectors, such as uranium and lithium, which are essential for new energy and producing lithium batteries and nuclear energy. Zimbabwe ranks second with a 22% share, with investments mainly in lithium within the metal sector, along with a small portion in the solar photovoltaic industry. Guinea, with 13% of the total investment, ranks third, which are focused on hydropower, promoting local clean energy development and utilization, effectively alleviating electricity shortages. The sector information can be found in Table 3. Besides, green BRI investments in other Africa countries totally accounts for 28%, located in Nigeria (6%), Kenya (6%), South Africa (4%), Egypt (4%), Uganda (3%), Morocco (3%) and Ghana (1%).

Table 3: Green BRI Investments in African Countries by Sectors (Million USD)

Sector	Countries	Subsector	Total Amount
Agriculture	Uganda	Farming	300
Energy	Egypt	Solar and wind power	350
	Ghana	Solar power	110
	Guinea	Hydropower	1160
	South Africa	Nuclear power	380
	Zimbabwe	Solar power	250
Metals	Namibia	Lithium	140
		Uranium	3000
	Zimbabwe	Lithium	1650
Real estate	Kenya	Water supply	310
Technology	Kenya	Telecommunication	170
	Nigeria	Electricity	550
Transport	Morocco	Lithium battery	280

Source: China Global Investment Tracker

From the perspective of industry distribution, China's green BRI investments in Africa based on sector and sub-sector are demonstrated in Table 3. From the table, it is seen that these investments are heavily concentrated in the metal industry, with a total investment of 4.79 billion USD, accounting for 55%. The second ranked industry is energy, which has a total investment of 2.25 billion USD, representing 26% of the total investment. Breaking it down, its sub-sectors include hydropower, solar energy, wind energy, and a small portion of nuclear energy. The remaining 19% of investments are distributed across technology, agriculture, transportation, and real estate. In the technology sector, related green investments involve basic network infrastructure and power transmission development. In transportation, the primary focus is on lithium battery production and manufacturing. The largest single green investment is associated with Uranium, which is related to mining activities and cannot directly improve the local green development.

Overall, from above analysis it can be noticed the strategic orientation of China's green BRI investments in Africa countries. Chronically, although annual green investments have fluctuation, recent years of a relative stabilization in the green investments' percentage indicates China's commitment and sustainability toward green BRI investments and local green development in African countries. Geographically, green BRI investments are mainly concentrated in some resource-affluent countries such as Namibia, Zimbabwe and Guinea. This investment pattern reflects a strategy that aim to secure essential minerals such as Uranium and Lithium, which are important for China's construction of a global clean energy supply chain. From the sector information, it can be seen that characteristics of green BRI investments are mainly associated with mineral, as well as integrated infrastructure such as energy generation, electricity transmission, telecommunication, transport and agriculture. This model of "resource acquisition and infrastructure building" is identified in green BRI investments in African countries.

This green investment strategy allows China to have a long-term access to critical resources and minerals, strengthening its capability of renewable energy production such as lithium batteries. Besides, by investing in local infrastructures can increase the economic and diplomatic bounding between African countries and China, as well as facilitating local living standards and economic growth. For instance, the deployment of solar, wind, and hydro power can greatly support residents' access to electricity, increase commercial activities, and drive the process of industrialization (Zhang, 2024). These investments can also promote to achieve the global decolonization goals and facilitate low-carbon lifestyle in African countries. Moreover, integrating resources acquisition with infrastructure deployments is conducive for Chinese companies to access African market or strengthen their market presences.

However, the intensive investments in mining sectors for essential minerals, particularity lithium and uranium, have posed an environmental challenge to relative African countries. These mining activities, if not place sufficient environmental safeguards, could result in land degradation and water contamination. Also, if there is no proper site restoration after the mining finished, long-term environmental damage would be caused. Therefore, these kinds of extractive investments are highly risked in terms of environmental impact if the effective environmental assessments, BRI environmental governance, and local community engagement are not in place or not executed well. Besides, Elish & AboElsoud (2024) have pointed out that, although these BRI investments into African countries promote economic growth, if economic engagements are limited to extractive exports without developing local value chain and technology transfer, the long-term economic growth in African countries may not be ensured.

5. Conclusion

This paper tries to investigate the Belt and Road Initiative (BRI), China's global outward foreign direct investment, and the China's Green BRI investments in African countries. China's green BRI investments have been expanding rapidly, with their share of total BRI investments stabilizing at approximately 40% over recent years. Given that African countries constitute a major group of BRI participants, this study focuses on the investment patterns, current status, development trends, and strategic models of China's green BRI investments in Africa.

99 BRI investment projects across 21 African countries from 2013 to 2023 are collected and classified as green and non-green investments. It is found that 22 of these investments were green, accounting for 22% of the total investment amount. By analyzing these investments from the perspectives of temporal trends, country distribution, and sector allocation, we found that recently the proportion of the green investments has accounted for more or less than 30% of the total investments, reflecting China's commitments to facilitate the green BRI development. Besides,

there are great heterogeneous green investments in terms of country distribution, with a large proportion in Namibia and Zimbabwe. Furthermore, these investments are mainly concentrated in the metal and energy sectors.

Regarding green investment strategy, this study concludes that China's green BRI investments in African countries primarily reflect a "resource acquisition and infrastructure building" model. These investments are concentrated in resource-rich countries to secure essential minerals such as lithium and uranium. At the same time, the green BRI portfolio emphasizes the development of clean local energy and infrastructure, including the expansion of hydropower, solar, and wind energy, as well as the construction of telecommunication and electricity transmission networks. Given the environmental risks associated with the mining activities, it is strongly suggested that these investments should be incorporated with adequate and effective environmental assessments and governance mechanisms into these BRI implementation processes

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