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China's Belt and Road Initiative: An Intuitive Insights Extraction from Text Document Clustering

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Abstract

China's Belt and Road Initiative (BRI) marks an unprecedented effort in building transport and energy infrastructure across Asia and Europe. Considering the scale of the initiative, there exist a large number of researches focusing on different aspects and topics. This paper intends to collate the textual data from academic studies and official reports to highlight important themes and issues that stand out from the geopolitical, environmental and trade aspects. Findings suggest that in the geopolitical context, China is still facing opposition from certain countries while its presence in the Arctic is one of its central foci. Within the environment corpus, most studies are focused on the historical trends of carbon emissions, consumption or inequality rather than predicting the impact of BRI on the environment. There are concerns by countries involved in the BRI regarding the impact of the development of new ports on possible disruption to their trade activities and competitiveness.

Keywords: *Belt and Road Initiative, geopolitics, environment, trade, text mining*

1. Introduction

Ever since the inception of the Belt and Road Initiative (BRI), the People's Republic of China (PRC) and its president Xi Jinping had promised for win-win cooperation and mutual benefits to its participating countries. In Xi's keynote speech at the World Economic Forum Annual Meeting in 2017, he emphasised the concept of "community of shared future for mankind" in which China is pursuing the goal of common prosperity for its citizens. Later in the year, during the first Belt and Road Forum (BRF), President Xi pushed the concept into the BRI, envisioning it as a vehicle in achieving peace, prosperity, opening up, innovation and forming connections between different civilisations. Through BRI (see Figure 1 "Major Stakeholders in BRI" and Table 1 "UN Agencies and Their Involvement with BRI"), China hopes that prosperity can be shared globally for humankind.

Despite its promises, BRI is plagued with controversies. Firstly, its financing model was put into question as the United States' Centre for Global Development warned on the debt sustainability of the member countries of the BRI. Utilising data from debt sustainability analysis taken from the IMF and World Bank, Hurley, Morris and Portelance (2018) discovered that smaller economies like Tajikistan, Montenegro, Laos, Mongolia and Djibouti are facing higher probability of debt distress as the debt-to-GDP ratios may exceed 50 percent in which more than 40 percent is owed to China. Such allegations had cast doubts in mega projects initiated in BRI member countries. According to the report, some of the eight countries flagged as high risk are Pakistan, Djibouti, Maldives, Laos and Mongolia.

Further, several parties had raised plausible accusations on the China-centric nature of the initiative. As highlighted by the Centre for Strategic and International Studies (CSIS), lion's share of the contracts for planned BRI projects were awarded to Chinese companies as

compared to the host country's contractors.

Security-wise, many scholars are pinpointing the BRI with PRC's expansion of political influence, especially in Central and South Asia which are lacking in a strong rule of law and governance.

Within the geopolitical context, scholars are citing the changing power dynamics between US and China for international order. Nevertheless, President Xi had set his nation's ambition to be a global leader by 2050 during the 19th Party Congress in which many Chinese experts are viewing his new vision as a new era for a quest for power (Duchatel, 2019).

Figure 1 Major Stakeholders in BRI

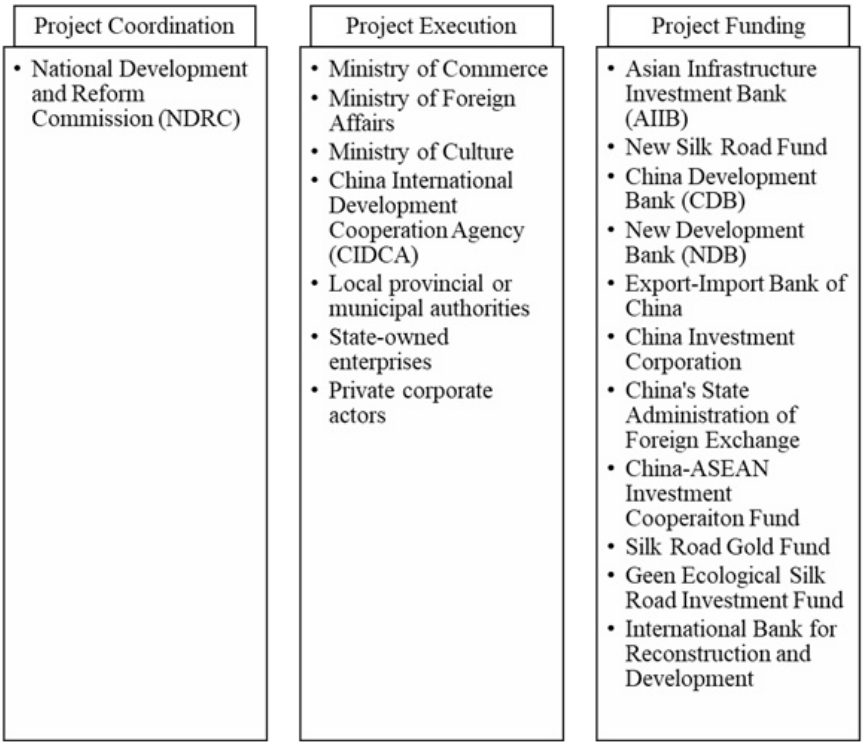


Table 1 UN Agencies and Their Involvement with BRI

No.	Agency	Engagement
1	International Monetary Fund (IMF)	• Policy advice • Launch of China-IMF Capacity Development Centre (CICDC)
2	World Bank Group	• Committed USD80 billion for infrastructure projects • Provides advisory services and analytics
3	United Nations Development Program (UNDP)	• Signed MOUs and Action Plan
4	United Nations Industrial Development Program (UNIDO)	• Bilateral meetings • Signed MOUs • Policy research Agreement of cooperation on infrastructure
5	Food and Agriculture Organisation (FAO)	• Policy coordination • Agricultural collaboration
6	International Labour Organisation (ILO)	• Signed MOU
7	World Meteorological Organisation (WMO)	• Signed Letter of Intent
8	International Maritime Organisation (IMO)	• Signed Letter of Intent
9	International Organisation for Migration (IOM)	• Provide support in promoting unimpeded trade along Belt and Road
10	International Telecommunication Union (ITU)	• Cooperation agreement of the BRI
11	UN Habitat	• Signed MOU
12	International Development Law Organisation (IDLO)	• Signed MOU
13	United Nations Economic Commission for Europe (UNECE)	• Joined the International Coalition for Green Development on the Belt and Road
14	World Intellectual Property Organisation (WIPO)	• Signed cooperation agreement
15	United Nations Economic and Social Commission for Western Asia (ESCWA)	• Conduct preparatory studies and strategy development
16	United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)	• Conduct policy research and facilitation
17	United Nations Educational, Scientific and Cultural Organisation (UNESCO)	• Deepen cooperation in TVET and skills training
18	United Nations Framework Convention on Climate Change (UNFCCC)	• Policy advice
19	United Nations Children's Fund (UNICEF)	• Invitation to UNICEF for their expertise in programme design and production
20	United Nations Office for South-South Cooperation (UNOSCC)	• Support South-South Cooperation • Nurture Youth Leadership for Agricultural Development in Africa
21	World Tourism Organisation (UNWTO)	• Policy advice for capacity building and marketing
22	Universal Postal Union (UPU)	• Signed Letter of Intent
23	World Food Programme (WFP)	
24	International Fund for Agricultural Development (IFAD)	
25	International Civil Aviation Organisation (ICAO)	

Source: United Nations (UN).

The insecurity against the initiative is reasonable. President Xi in his Chinese Dream asserted the idea of China with strong armed forces and as a maritime nation. Within ten years, military funding went up by 83%. Aside from that, China is establishing its military presence elsewhere; setting up its first naval base in Djibouti, a small military outpost in Tajikistan and joint patrol with the Afghanistan army.

Other scholars like Len (2015) and Dhaka (2018) perceived the BRI as a charm offensive strategy – China's tactics to win over its territorial disputes in the South China Sea. Apart from US's meddling in its territorial disputes, China is facing resistance from other ASEAN countries such as the Philippines and Vietnam over the control of the South China Sea. This may hinder the development of the 21st Century Maritime Silk Road apart from other factors such as regime change of member countries and unfamiliarity with the practices of Chinese companies. The vagueness and lack of transparency had also become major hindrances of the execution of BRI.

Scholars are also divided on the environmental impact of these infrastructure projects. Xiao, Cheng and Wang (2018) analysed the BRI model with sustainable development models and observed a unified inherent value that is vital for its participating countries to reach the Sustainable Development Goals (SDGs). The authors also addressed the wide gaps among countries in term of its sustainable development composite index and the average score for infrastructure development is the lowest as compared to other indices such as environmental and social sustainability.

Based on the environmental Kuznets curve, Teo *et al.* (2019) explored the possibility of the BRI in reducing the environmental pollution of its member countries. China, its host country managed to reduce its CO_2 emissions through research and technological upgrades whereas the cost of renewable energy infrastructures had gone down due

to large investment. In fact, the authors cited Chinese initiatives in upgrading coal plants and power grids through technology transfer in Tajikistan, Bangladesh and Kyrgyzstan.

Yet, the authors also acknowledge the loophole in the Chinese environmental protection policies. Firstly, considering the scale of BRI, working under multiple jurisdictions and countries pose a problem in successfully implementing projects that are environmentally safe. Apart from that, enforcement of these policies is weak and they are only binding with Chinese SOEs and not its private sectors. Inconsistent environmental standards or guidelines could also pose a threat in the development of BRI as the Green Finance Initiative discovered that "green" BRI projects may not be as green by international standards.

For instance, the initiative had no known key performance indicators (KPIs) in which much of its projects are not tied with any environmental impact assessments (EIAs) or any equivalent assessments (Tracy, Shvarts, Simonov and Babenko, 2017; Ascensão *et al.*, 2018).

This exerts important concerns and pressures in the global stage as China is planning for infrastructure projects in almost every region in the world. Yet, if the violation in environmental protection is rampant, it will not only paint a negative view on the initiative and China but also worsening the climate crisis, losing biodiversity and destruction of an ecosystem.

In the discussion of this topic, the vast body of literature resulted in diverged views on the possible outcomes of its inception due to two main prospects – one in which the BRI is purely an economic cooperation promoting win-win cooperation for its member countries, a way for China to open up and promote its currency, a tool for the country to escape its middle-income trap and a complementary policy for US's Asia Pacific Rebalancing Strategy. On the other hand, some scholars viewed the initiative as China's attempt to topple the US's

dominance in the global stage, a way to seek global political leadership and sharpen its influence (Xiao, Cheng and Wang, 2018). As a result, many studies have contrasting views and results regarding the initiative which is hampering the development of the initiative itself.

Considering the scale and scope of the BRI, there is a need to consolidate the research results of its impact on geopolitics, environment and trade for its participating countries. This study will provide a unified analysis to identify the main themes and issues discussed on BRI.

This study intends to extract insightful information from two different sources which are academic papers and official reports. By grouping similar type of information (i.e., three major aspects; geopolitics, environment and trade), it can benefit further analysis based on insightful information retrieved and extracted from the documents.

2. Literature Review

With the large scale and scope of BRI, academicians across various sectors had conducted various impact assessments of these projects on a nation's environment and geopolitical influences.

2.1. Environmental Concerns

Despite the initiative being lauded as the engine of economic growth in some countries, it is undeniable that some of these projects may degrade the environment through habitat loss, overexploitation of resources and landscape degradation. Ascensão *et al.* (2018) cited World Wildlife Fund's (WWF) report on how proposed BRI projects are overlapping with 1,739 Important Bird Areas (IBAs) which importance were recognised for the conversation of bird populations. On top of that, it was also reported that these projects are within the range of 265 threatened species of which 39 are critically endangered.

Although the authors acknowledged China's recent efforts in improving the legal landscape to protect its environment, other developing and least developed economies in the BRI are not likely to prioritise on such issue considering their main goal is for raising economic and social standards. Given China's Ecological and Environmental Cooperation Plan under BRI that strive for environmental protection, the authors suggested for the incorporation of Strategic Environmental and Social Assessments (SESA) into the BRI framework, especially in the initial stage of decision making.

Tracy, Shvarts, Simonov and Babenko (2017) made a strong case against the BRI after discovering that PRC are shifting its pollution-heavy activities away from China and towards BRI member countries. PRC had negotiated with Russia in early 2016 to shift industries like cement, metallurgy and chemical plants toward Russia's eastern area. Besides, the authors asserted that under China's new environmental policy, cement producers were given three options; (a) upgrade to energy-efficient technology, (b) pay for the costs of environmental damages or (c) relocate manufacturing facilities outside of China. This is due to the cement industry's major contribution of smog in Chinese cities and a major consumer of energy. Hence, countries with weak environmental laws and poor economies such as Tajikistan became a central focus for China's Huaxin Cement and a private Zhejiang producer to build a cement factory there. Thus, Tracy, Shvarts, Simonov and Babenko (2017) implored member countries to incorporate Environmental Impact Assessments (EIAs) for any BRI-related projects proposed by China.

Other scholars like Teo *et al.* (2019) took a step further by creating a typology of each BRI infrastructure, studying the possible direct and indirect impacts on its hydrosphere, biosphere and geosphere. For instance, transport infrastructure bears the risk of air pollution, acid rain

while also endangering wildlife habitats and exotic species. Energy-related infrastructure like coal and hydropower plants bring significant impact on the environment in relative to wind and solar farms.

Conversely, a study by Saud, Chen, Danish and Haseeb (2019) utilised the panel unit root tests on 59 member countries of BRI to discover a strong negative relationship between financial development (FDI and DDI) towards environmental degradation. The authors argued that an enhanced financial development help to mobilise capitals for environmentally friendly projects by utilising better technologies.

2.2. Geopolitical Concerns

2.2.1. China and the US

Consistently throughout its operation and execution, certain countries and media in general had painted a rather negative notion on BRI. One evident opposition against PRC as of recent came from the U.S. The feud had academicians predicting the Thucydides Trap, the inevitable eruption and subsequently, a war between two major powers.

Under Obama's administration, Washington's initial reaction towards the initiative is mixed. Citing US Deputy Secretary of State's speech in 2015, Cai (2018) highlighted US's willingness to cooperate and coordinate with PRC on their respective policies over Central Asia. Conversely, Washington had negatively reacted to PRC's growing influence in the Asia-Pacific region, allying on countries that are also weary of PRC.

Fast forward to today, under President Donald Trump's radical stance of "America First", the leading nation shifted the tone by being protectionist and inward-looking. Steve Bannon, then senior political adviser to Trump highlighted the contradiction between Trump and Xi, saying in an interview: "I think it'd be good if people compare Xi's

speech at Davos and President Trump's speech in his inaugural. You'll see two different world views". Trump backtracked from the Asia-Pacific, leaving the now-defunct Trans-Pacific Partnership Agreement (TPPA). Seeing the opportunity, PRC revived the trade deal called Regional Comprehensive Economic Partnership (RCEP) in which all 11 countries had agreed to proceed without US in the negotiation (Nordin and Weissmann, 2018).

2.2.2. China and EU

Historically, China had been trading with the Europeans through the Silk Road for silk, chinaware and tea. This relationship continues until the present day as Europe remains as China's largest trading partner. The bilateral cooperation transcends trade as both parties continue to cooperate for investment opportunities through the AIIB in which 14 European countries with the likes of France, Germany and Britain are members.

However, political ties between the two superpowers are not as long-standing as their economic ties. Zeng (2017) highlighted Europe's marginalised role in China's foreign policy discussions, especially under Xi's leadership. In 2014, PRC's Vice-Minister of Foreign Affairs asserted that BRI's vision is to connect Central Asia, Southeast Asia and Western Asia with a part of Europe. Its vague statement on Europe, leaving a big question on which part of Europe is connected to the initiative.

EU's European Parliamentary Research Service (EPRS) views the BRI as China-centric and a medium for China to build geopolitical influence. The think-tank made a case by exemplifying UN Security Council's acceptance of the "community of shared destiny" concept into the UN Human Rights Council resolutions. Apart from that, PRC's lack of transparency on BRI projects, lion's share of contracts for Chinese

firms and the use of Chinese standards instead of international ones were also highlighted.

EU's political ties with China was also made apparent after Italy decided to join BRI in early 2019. Despite not being the first EU country to participate in the initiative (Greece and Hungary participated earlier), the EU was quick to accuse PRC of playing the "divide and rule" game in the region (Zhao, 2016).

2.2.3. China and Southeast Asia

A growing body of literature had examined the perception of various countries or regions, analysing their acceptance or rejection towards BRI. Sein (2016) highlighted three different responses drawn by ASEAN member countries while dealing with BRI; enthusiastic, cautiously positive and sceptical. Philippines, Vietnam and Myanmar are sceptical wherein Cambodia, Laos and Thailand were found to be enthusiastic towards the initiative. The remaining member countries; Brunei, Malaysia, Singapore and Indonesia adopt a rather cautiously positive sentiment, largely due to the territorial tensions in South China Sea. The same can be said for EU member countries where Central and Eastern European Countries (CEEC) welcomed China with open hands as compared to older EU members such as Germany, France and the UK. Italy being the exception, had joined BRI as one of its participating countries.

2.3. Trade Concerns

BRI brings optimistic impact on trade across the world. Many institutions had deployed relevant econometric models in evaluating its impact on trade. Lu, Rohr, Hafner and Knack (2018) examine the airport, railway and road density including the logistics performance

index of each BRI country. Across the first three indicators, Mongolia and Russia own the least density of transport infrastructure whereas UAE has the least railway and road density and Kazakhstan has the least airport and road density. For comparison, the airport, rail and road density of EU countries are 0.732, 0.055 and 1.451 respectively whereas the BRI countries collectively own 0.125, 0.010 and 1.315 respectively, highlighting the need for new and improved infrastructure for developing and least developed BRI countries.

From the study, the authors deployed the gravity model to estimate the impact of improved transport infrastructure and connectivity under the initiative. It was found that having an increase in railway connection will significantly boost exports of BRI countries by 3%. Further, improved transport infrastructure will not only enhance trade for BRI countries but will also boost trade with the EU and other countries.

Garcia Herrero and Xu (2017) used three scenarios to estimate the impact on trade for EU countries. First scenario explores the result of trade due to a reduction in trade costs meanwhile the second scenario played with the possibility of establishing a free trade agreement (FTA) for the BRI region. Final scenario combines the first two scenarios. Results indicate a clear win for each EU country on the first and third scenarios with negatively insignificant impact from the second scenario.

Despite a plethora of studies concerning BRI within its three main aspects, there was no known effort in applying text mining analysis to detect recurring themes within the literature considering a large amount of textual data available. One recent effort from a team of researchers Thürer *et al.* (2020) brought about a comprehensive systematic review of 173 peer-reviewed articles which was conducted manually through a two-dimensional matrix. However, the findings of the study are limited as other white papers or official documents were excluded from the sample and the study focused mainly on the impact of BRI on the global

supply chain.

Prior attempts in applying text mining analysis on BRI gravitate towards the news media narrative; sentiment analysis by Arifon, Huang, Zheng and Melo (2019) on Twitter accounts of four news outlets based in Europe and China, analysis of about 100,000 news headlines within the media outlets in China and the Korean Peninsula (Li and Jin, 2019) and comparative analysis of news discourse regarding the initiative (Zhang and Wu, 2017; Xin and Matheson, 2018).

Therefore, this study will address the main tropes of BRI's academic literature and official documents by focusing on a wider scope of foreign relations, sustainability and trade activities in order to have a better comprehension of the challenges or opportunities that lie ahead for this initiative. This study will be assisted by several text mining tools to provide clear-cut findings from the literature gathered.

3. Methodology

This section discusses the data collection, methodology, tests and procedures and the conceptual framework. Considering the large scale of the BRI, there is a rich amount of studies conducted by scholars and researchers in various fields. This study intends to study BRI in relation to three aspects; geopolitics, environmental and trade. Using big data analysis, textual content analysis will be conducted with text mining approach. Although the text mining method is relatively new in the academic research, one study by O'Mara-Eves *et al.* (2015) agrees on the efficiency of text mining analysis when discovering that workload reduction can occur by 30-70%.

Simply put, text mining is a process of extracting notable and meaningful information from free or unstructured textual data (Kao and Poteet, 2005). For this study, unstructured textual data refers to any

portable document formats (PDFs) or Word document retrieved during data collection. A collection of these documents is called corpus.

3.1. Data Collection and Grouping

This study will collect data from two different papers; academic papers and official reports. Approximately 100 official reports and academic papers published from 2013 to 2020 regarding the initiative will be included for review. Academic papers will be collected from two abstract and citation databases; Google Scholar and Scopus. Search queries made include several terms such as "One Belt One Road", "Belt and Road Initiative", "BRI", "Chinese BRI", "New Silk Road", "New Silk Route", "Polar Silk Road" and "Maritime Silk Road".

Meanwhile, the official reports are derived from several organisations and official documents released by the PRC itself (see Table 2). Official reports were included in this study as it provides a factual perspective and results as compared to academic papers that may be tainted with personal biases from researchers on the initiative. On top of that, a brief abstract review will be conducted in order to identify and group these papers according to three recurring themes of this study.

In the initial stage, a total of 402 academic papers were collected. By conducting a review on the titles and abstracts of these papers, about 23 papers were removed as the research scope does not relate to the three research questions of this study. Further, another 7 papers were excluded from the review process as it only serves as historical explanation and literature review of the BRI. However, these papers will be utilised for the earlier section of this study in introducing the BRI.

Thus, a total of 372 academic papers will be included in this study in which 180 papers are regarding to geopolitical issues, 82 papers on the environmental aspects, and 110 on trade analysis.

Table 2 List of Official Reports

Institutions	Number of Official Documents/Reports
People's Republic of China	7
Leading Group for Promoting the Belt and Road Initiative	1
China International Development Cooperation Agency	2
China Council for International Cooperation on Environment and Development	1
World Bank	7
United Nations	3
World Wide Fund for Nature (WWF)	1
National Bureau of Asian Research	4
OECD	1
Stockholm International Peace Research Institute (SIPRI)	3
Bruegel	1
RAND	1
German Institute for International and Security Affairs	1
McKinsey	1
Total	**35**

3.2. Transforming Unstructured Textual Data to Structured Data

These unstructured texts will then be transformed into structured data during the pre-processing step. Orange3 software provides several methods for this, namely transformation, tokenisation, normalisation and filtering.

3.2.1. Transformation

The first method of pre-processing is data transformation. This includes transforming each word in the corpus as lowercase and removing any accents detected for uniformity.

3.2.2. Tokenisation

Tokenisation is a pivotal step in NLP as it segments the whole text in a document into smaller components such as words, punctuation and

numbers.

3.2.3. Normalisation

As large parts of the texts apply grammatical rules (i.e. eat, eats, eating, ate), there are two main methods- stemming and lemmatisation that help in transforming these inflected words into its base words.

3.2.4. Filtering

Stop words are defined as commonly used words such as 'a', 'the', 'and', 'or' and 'in' which do not represent any significant meaning and must be removed prior to data analysis.

3.3. Data Analysis

After transforming the unstructured textual data into structured data, data analysis is required. There is various analysis provided in text mining according to the initial objective of the research. Firstly, the "Duplicate Detection" widget will be used in order to detect any similarities amongst the documents collected. This is highly important as the similar documents may interfere with results in further analysis.

Primarily, this study will utilise the "bag of words" widget in the Orange3 software. This includes the term frequency-inverse document frequency (TF-IDF hereafter) parameter, a simple statistical measure used to evaluate how important a word is to a document or the corpus (collection of documents) as follows:

$$\frac{Term\ Frequency\ (TF)}{Inverse\ Document\ Frequency\ (IDF)}$$

4. Results and discussion

This section provides an analysis for the result. This section will discuss on the document maps to explore the spread of research studies on BRI and non-BRI countries while also exploring context of the discussion followed by an extensive analysis on the context for 3 of the most important terms in each corpus.

4.1. Geopolitics *Corpus*

Table 3 Top 10 Country Mentions for *Geopolitics* Corpus

Country	Number of times mentioned
China	153
Russia	63
India	60
Malaysia	39
Pakistan	38
Japan	36
Kazakhstan	36
Myanmar	34
Iran	32
Indonesia	29

Figure 2 Document Map for *Geopolitics* Corpus

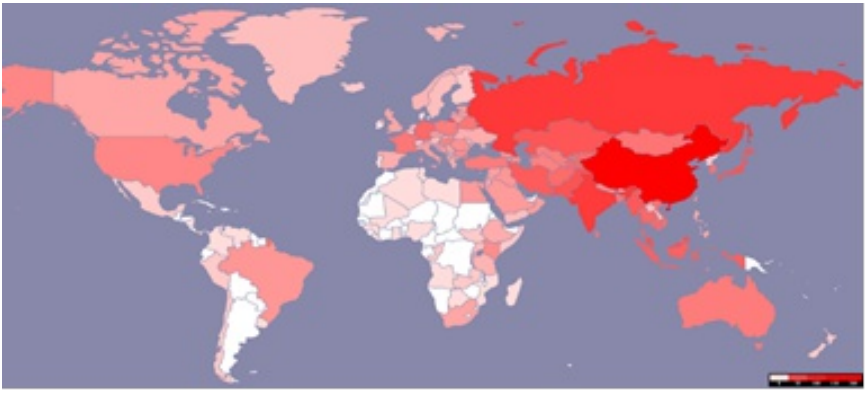


Table 3 lists down the 10 highest frequencies of countries mentioned in the *geopolitics* corpus. China has the highest number of mentions (153 times), followed by Russia (63 times) and India (60 times).

4.1.1. Russia

Russia is the second most mentioned country within each corpus. In the discussion on energy and security, Russia's position within the Arctic Circle came up more than any other Arctic States such as Canada (6 times), Norway (4 times) and Sweden (3 times). China's presence in Russia's Far North region of the Arctic started even before the development of PSR, as both countries cooperated for the liquified natural gas (LNG) plants in the Yamal Peninsula. These had led to the development of other projects in the region including Gydan Peninsula's LNG project, Sabetta seaport at the Yamal Peninsula and China-owned China Oilfield Services Limited's partnership with Russia's Gazprom drilling rig at Leningradskoye (Erokhin, Gao and Zhang, 2018).

Another recurring theme in the discussion on China-Russia relationship is the power dynamics with former Soviet states. Russia's own economic plan called the Eurasian Economic Union (EEU) overlaps with China's BRI and the Shanghai Cooperation Organisation (SCO) which also include other Central Asian countries.

4.1.2. India

India and China's territorial disputes were put into spotlight in academic studies relating to BRI. Although India is part of the BRI ecosystem through the planned BCIM corridor, the South Asian country reserved itself from participating in BRI and was absent during the Second Belt and Road Forum in 2019. In fact, India's External Affairs Minister

S. Jaishankar reinforced India's stand against BRI, citing sovereignty matters as one of its causes of resistance.

Lags and delays in the development of BCIM is understandable considering that both countries have multiple disputes concerning different geological areas including Pakistan's involvement through CPEC which creates access for China to the Gulf and the Indian Ocean via the Karakoram Highway (Bhattacharjee, 2015). China's increased presence in Pakistan Occupied Kashmir (POK), specifically in the Gilgit-Baltistan area, made the situation worse as both Pakistan and India are involved in a longstanding rivalry stemming from the 1947's partition of British India.

Table 4 is a tabulation of the 10 largest and smallest words from the word cloud based on the weightage calculated. "Arctic" has the highest weightage of 15.00 while the word "Soviet" has the lowest weightage of 1.97 in the *geopolitics* corpus. "MSRI" refers to Maritime Silk Road Initiative meanwhile "IOR" represents the Indian Ocean Region and "NSR" represents the Northern Sea Route.

Table 4 Word Weightage for *Geopolitics* Corpus

Word/Term	Weightage	Word/Term	Weightage
arctic	15.00	ior	2.01
cooperation	12.40	nsr	2.01
msri	12.10	uzbekistan	2.01
investment	11.90	usa	1.99
security	10.90	war	1.99
policy	10.10	social	1.99
infrastructure	9.76	diplomatic	1.98
power	9.01	stability	1.98
energy	7.81	train	1.98
asean	6.43	soviet	1.97

Figure 3 Word Cloud for *Geopolitics* Corpus

4.1.3. Arctic

China's growing presence in the Arctic is the most discussed theme in term of geopolitics and security. China's Arctic Policy released in 2018 marked its aspiration to incorporate the Arctic shipping routes into the BRI logistics network while expressing interests in oil and gas exploration in Russian and Northern Europe territories (Erokhin, Gao and Zhang, 2018).

The Arctic Blue Economic Corridor (ABEC) shipping route is China's version of BRI in the Arctic, connecting the Nordic countries with Russia's Northern Sea Route (NSR) and China. Russia's warm welcome over this initiative is partly due to its massive economic potential. Currently, Russia's Arctic region contributes to 10% of its GDP and 20% of its export revenue. It also produced 95% of its gas resources and 70% of its oil and high shares of metals. Yet, international

transit shipments in the region had decreased due to the lack of infrastructure and cheaper fuel that eliminated the need for a shorter shipping route. Thus, ABEC may help boost economic activities and trade within the region.

Meanwhile, EU's policy in the Arctic is largely transportation-oriented due to its competitive edge in the construction of icebreakers and cargo vessels. Denmark's lead in shipbuilding may align with the development of ABEC especially since Greenland is located between the US and Europe. Finland prioritised on research and scientific studies in the Arctic, providing knowledge-based services on the region. This is largely due to it not having direct access to the Arctic seas. The same can be said for Sweden as it does not have access to the Arctic shipping routes and is providing research in environmental protection and biodiversity (*ibid.*).

One vocal opponent of China's presence in the Arctic is the US, an Arctic nation whom questioned China's sovereignty and role in the region. Referring itself as the "near-Arctic state" in its policy papers further exacerbated the situation as the title was not granted with any official recognition.

4.1.4. Cooperation

The term "cooperation" appeared abundantly in the *geopolitics* corpus. As China is expanding the scope of the BRI, cooperation with international actors is pivotal in maintaining the stability of each project. One central theme in BRI is the win-win cooperation formula that benefits both parties and the rest of the world. President Xi asserted that regional cooperation should expand beyond mutual benefits to shared belief that is now known as the 'community of shared destiny'.

Beijing's peripheral diplomacy discussed by Callahan (2016) can be traced back to Deng Xiaoping's foreign policy that focused on economic

cooperation rather than security rivalry. AIIB, Shanghai Cooperation Organisation (SCO) and various economic corridors and under the BRI portrayed such element on China's current foreign affairs, marking a significant departure from its more assertive policies around 2010. Under the peripheral diplomacy, China had also built military cooperation with various countries including Russia, South Korea, Malaysia, Thailand and Singapore on joint military activities.

Lim (2018) asserted that China's cooperation with Arctic nations remains integral in achieving its ambition in the region. This was made clear in China's Arctic Policy that values international cooperation to maintain a peaceful and stable Arctic order. In fact, four basic guiding principles outlined in the white paper are respect, cooperation, win-win result and sustainability (Erokhin, Gao and Zhang, 2018).

Chen and Yao (2017) highlighted on how pragmatic cooperation helps in accelerating plans in the MSR countries. One example drawn was its cooperation with Indonesia whom proposed the Global Maritime Fulcrum (GMF) back in 2014 to enhance inter-island connectivity among its archipelagos. Cooperation between the two countries helps in aligning and achieving their ambitions. The Jakarta-Bandung High Speed Railway is China's 150 kilometres flagship project that connects the capital with its fourth largest city.

In some cases, cooperation transcends inter-governmental relations. China and Malaysia first set up the Sister Industrial Parks in 2012, in which more than USD30 billion were channelled to the Kuantan Industrial Park meanwhile the Qinzhou Industrial Park managed to attract over USD19 billion in total investment from 50 industrial projects. Following the success of the cooperation, Malaysia established a port alliance for its 9 ports with 12 Chinese ports for knowledge and best practices sharing as well as port terminal investment.

4.1.5. MSRI

The Maritime Silk Road Initiative (MSRI) consists of a sea route that extends from major ASEAN countries to Sri Lanka's Port of Colombo, Djibouti in Eastern Africa, the Suez Canal, Port of Piraeus in Greece and ends in Italy's Port of Trieste. It further extends toward Central Europe and the North Sea through a railway network.

Despite its central focus on trade, MSRI involves various other non-trade hard infrastructure projects including the China-Maldives Friendship Bridge that connects the capital of Male with the nearby Hulhule Island for tourists and locals commute as well as an expansion project for Maldives's Velena International Airport.

Narratives revolving around MSRI are plentiful. Blanchard (2018) discussed the various characterisation of China's intentions, from a political and economic standpoint to the allegations of it being China-centric and the country's exertion of hard versus soft power on participating countries. Len (2015) claimed that MSRI is part of China's strategy in repairing its image over the South China Sea's territorial disputes in Asia.

Regarding the assertion over MSRI being China-centric, one scholar went as far by claiming its intention to restructure Asia's political, economic and security order as well as the dept-trap allegations that were largely associated with projects in MSRI. Yet, the claims were later denounced as one Chinese State Councillor stated that these projects should be sustainable to ensure economic benefits. Rajah, Dayant and Pryke (2019) also refuted the claims, stating that to date, there is no evidence of China being the primary driver of debt risks in smaller countries.

On the soft and hard power claims, Blanchard (2018) asserted that although there is no evidence of hard power being exerted by China, the

construction of seaports that also serve as its naval bases in Port of Doraleh in Djibouti and Gwadar Port in Pakistan is the main concern, especially amongst Indian scholars. Chinese State Councillor refuted the claims, stating China's intolerant over "monopoly or coercion" on the initiative. One Chinese scholar pointed out that MSRI serves only for economic benefits and security over the sea lines of communications. Nevertheless, Blanchard (2018) opined that there are several unwarranted narratives behind MSRI and that China will continue facing opposition over protectionism, instability and competition from national actors.

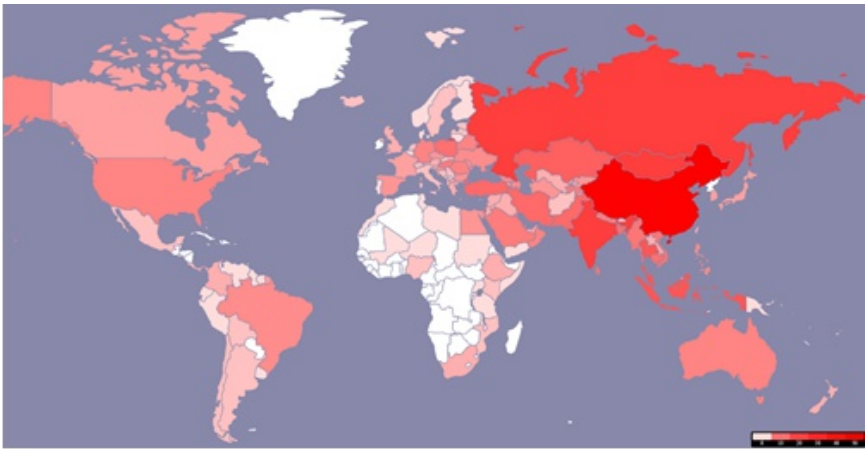
4.2. Environment *Corpus*

Table 5 Top 10 Country Mentions for *Environment* Corpus

Country	Number of times mentioned
China	49
Mongolia	22
India	22
Russia	21
Indonesia	15
Malaysia	15
Thailand	15
Kazakhstan	13
Iran	11
Turkey	11

Table 5 tabulates the frequency of mentions based on the document map above. China is the most mentioned country in the *environment* corpus (49 times) meanwhile its closest neighbours, Mongolia and India were mentioned 22 times.

Figure 4 Document Map for *Environment* Corpus



4.2.1. Mongolia

Mongolia is a landlocked country that shares its borders with China and Russia. A trilateral meeting was first conducted in 2014 which brought to the signing of MOUs the following year for 32 projects within CMREC. Mongolia sourced its energy primarily from its 7 coal-fired power plants and 2 hydropower plants. Under the UN Framework Convention on Climate Change's Intended Nationally Determined Contributions (INDC), the country pledged to reduce its greenhouse gas emissions by 14% through its shift towards renewable energy (Ren, Liu and Zhang, 2017).

China's Ministry of Ecology and Environment first introduced the Green Economy Research Fellowship Programme, in participation with UN Environment, for both Mongolia and Central Asian countries. This six-week fellowship at Beijing Normal University

exposed local researchers on green investment and water sector while also participating in a policy roundtable on green economy.

4.2.2. India

Despite the geopolitical rift between China and India as highlighted earlier, 90.4% of India's coal-fired power projects involved Chinese corporations. However, ever since 2010, China's presence shrank due to several changes in India's domestic policy relating to energy and its own INDC to reducing carbon intensity by 33-35% by 2030.

Being the second most populous nation after China, India has its sets of issues on environmental degradation. Fang *et al.* (2020) asserted that urbanisation as the main driver of the decline in air quality and that India's atmospheric particulate matter (PM) had continuously increased continuously over the past 16 years.

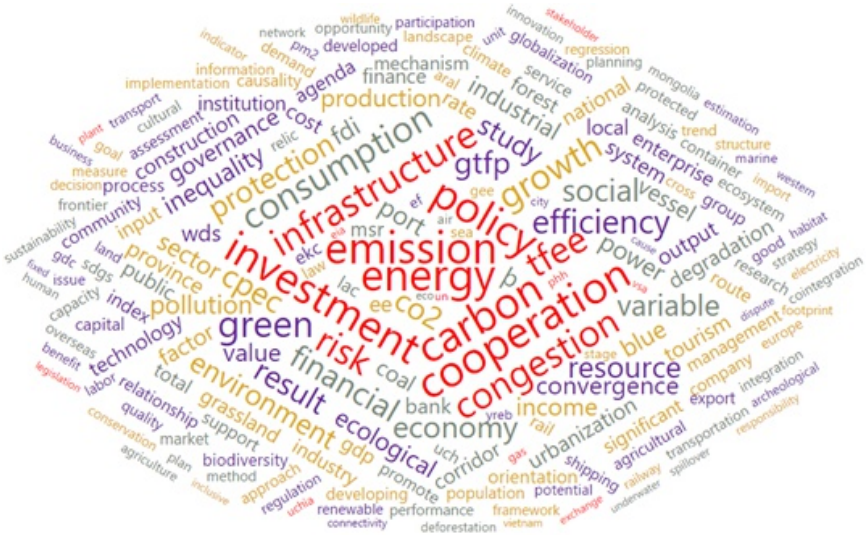
Although most BRI countries are lacking in environment-related research activities (Jia, 2017), one study by Liu *et al.* (2019) suggested for BRI to be utilised as a knowledge-sharing platform for both China and India to share their expertise and understanding on ecological preservation. The authors cited the success of India's Sustainable Landscapes and Restoration program established to improve forest and tree covers with positive impact on biodiversity conservation, food security, and the rural economy.

Table 6 lists down the weightage of each of the 10 most prominent and least prominent words according to the word cloud. "Energy" has the highest weightage throughout the whole corpus with 22.80 whereas "legislation" has the least weightage with 2.53. A few acronyms listed are "PHH", "UCHIA", "UN", "EIA" and "VSA" refers to the pollution haven hypothesis, underwater cultural heritage impact assessment, United Nations, environmental impact assessment and vessel sharing agreement respectively.

Table 6 Word Weightage for *Environment* Corpus

Word/Term	Weightage	Word/Term	Weightage
energy	22.80	gas	2.94
emission	17.70	phh	2.89
carbon	16.90	uchia	2.88
investment	14.20	responsibility	2.84
cooperation	13.00	plant	2.74
policy	12.70	un	2.73
infrastructure	11.30	eia	2.71
risk	10.90	vsa	2.66
congestion	10.80	exchange	2.57
tfee	10.80	legislation	2.53

Figure 5 Word Cloud for *Environment* Corpus



4.2.3. Energy

During the Second Belt and Road Forum, the concept of a green Silk Road was proposed, as a way for countries to share their knowledge and expertise in combatting climate change. This is in accordance to the Belt and Road Science, Technology and Innovation Cooperation Action Plan in 2016 that highlighted energy efficiency and emission reduction into technological cooperation and joint development (China Council for International Cooperation on Environment and Development, 2018).

There is a primary concern over BRI and environmental protection due to its investment in coal and energy sector in other countries. On top of that, Tekdal (2018) claimed that China is transferring its highly polluting industries to BRI countries as in the case of the shift of its cement industry to Tajikistan.

However, Lechner *et al.* (2020) asserted that Chinese investment in BRI countries is relatively small from its overall investment profile. Yet, the negotiation and awarding process of the energy projects must be further scrutinised. The authors exemplified Indonesia and Malaysia on how the energy investments correlates with the governance of host countries. Indonesian protectionist policy over its mining sector inhibits foreign ownership and thus Chinese investment shift from mining to coal power plants and construction.

As for Malaysia, former prime minister Najib Razak negotiated energy projects linked with the scandal-plagued 1MDB. Under the first regime change in 2018, Malaysia put both Multi-Product Pipeline (MPP) and Trans-Sabah Gas Pipeline (TSGP) under scrutiny and is now under review.

4.2.4. Emission

Carbon emission from the maritime industry is a cause of concern. It is forecasted that by 2050, CO_2 emissions from maritime shipping may increase by 50% to 250% depending on economic growth and energy developments. Dong *et al.* (2019) highlighted that the existing ports in MSRI has different environmental performances due to the variety of port operating systems and layouts. Fully automated ports in Shanghai, Antwerp and Singapore have less CO_2 emissions during its operation. There are a number of initiatives and policies such as the Maritime Singapore Green Initiative and the Ship and Port Pollution Prevention Special Action Plan (2015–2020) in China. The International Maritime Organisation (IMO) set a specific goal in 2018 to reduce greenhouse gas emissions by at least 50% by 2050.

Chen *et al.* (2020) asserted that a low-carbon transformation policy within BRI context may not be easy as most member countries rely on coal as its source of energy although price reforms in clean energy and increasing coal prices may help. For emission reduction measures, implementing carbon emissions trading market or carbon tax is effective in developing alternative source of energy and low-carbon technologies. The authors suggested for China to lead by strengthening dialogues and discussion on eco-environmental policies and reach agreements in relation to law and regulations as well as technical practices.

4.2.5. Carbon

There are several usages of the term "carbon" within the environment corpus, one from the "Blue Carbon Cooperation" while others may refer to the "carbon dioxide", "carbon footprint", "carbon emissions" and so on.

The blue carbon cooperation was etched in China's Vision for Maritime Cooperation under the Belt and Road Initiative in which they proposed for a joint effort along the MSRI. It refers to any activities that use marine activities to absorb and store carbon dioxide in the atmosphere. Scientific studies had discovered that salt marshes, mangroves and seagrasses are among the most efficient in carbon-storing capabilities. It is worth noting that such initiative had been practised by many NGOs and companies including the South Pole Group, Conservation International and China itself among others.

Zhao *et al.* (2019) adopted a simulation approach to construct a blue carbon cooperation network in the MSRI region and suggested for the involvement of financial institutions to provide supple financing on blue carbon investment while China could increase funding on research to develop new techniques or strategies to ensure the efficiency of the project.

Climate change and green development is a central issue in BRI. Han *et al.* (2020) studied the carbon inequality and discovered that the carbon emissions per capita of BRI countries are lower than global average although its cumulative growth rate is higher than non-BRI countries. Among member countries, the inequality in carbon emissions decreased from 0.19 to 0.06 although there is a big gap between countries and regions.

Muhammad, Long, Salman and Dauda (2020) studied both the impact of urbanisation and trade among BRI countries. Urbanisation showed the presence of Environmental Kuznets Curve (EKC) hypothesis only in upper and high-income countries as urbanisation has an inverted U-shaped relationship with carbon emissions. Interestingly, the study confirmed the presence of the pollution haven hypothesis as industrialised nations set up factories abroad will look for the cheapest option in resources.

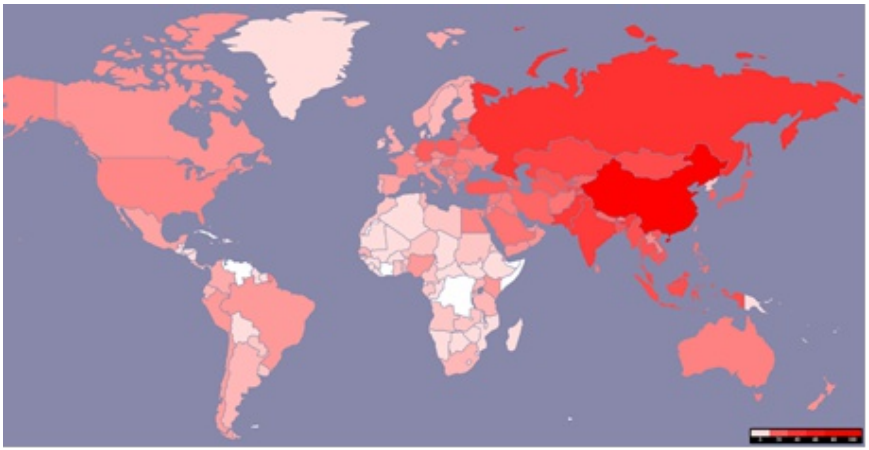
4.3. Trade *Corpus*

Table 7 Top 10 Country Mentions for *Trade* Corpus

Country	Number of times mentioned
China	82
Russia	40
Pakistan	36
India	35
Kazakhstan	30
Mongolia	27
Malaysia	27
Indonesia	25
Thailand	24
Cambodia	23

Table 7 represents the tabulation of the 10 most mentioned countries in the *trade* corpus. Again, China leads with 82 mentions, followed by Russia (40 times) and Pakistan (36 times).

Figure 6 Document Map for *Trade* Corpus



4.3.1. Russia

Considering that 3 major economic initiatives run through Russia; NELB, CMREC and Polar Silk Road, it is not surprising that Russia was considerably mentioned in the *trade* corpus. Not only that Russia benefits from the logistics integration with the Eurasian region, Cieślik (2020) discovered that the indicative trade potential from China to Russia could rise to 10% for wholesale and retail trade, chemicals and pharmaceutical products.

In term of energy trade, China had invested USD400 billion for the Power of Siberia's gas pipeline that travels 1,800 miles to China's industrial hubs in the northern region. An additional USD55 billion is expected as both countries are in discussion for a second gas pipeline which if signed, helps to market LNG gas from Russia's Yamal gas plant in the Arctic.

Russia's control over the Northern Sea Route (NSR) allows it faster access to European countries although historical shipment route went as far as Liberia and Panama (Zeng *et al.*, 2020). Due to its unique climate, NSR is easily accessible in summer when the ice melts.

4.3.2. Pakistan

Pakistan is one of the largest beneficiaries under BRI through its many planned infrastructure projects under CPEC, BRI's flagship project. One that stands out is the Gwadar Port, the largest deep seaport in the world. Through China's involvement, the seaport will be turned into a smart port city while eyeing for the possibility of becoming the main gateway for trade with the landlocked Central Asian countries and Western China due to its close proximity (Shibasaki, Tanabe, Kato and Lee, 2019).

This could help diversify Pakistan's trade considering that its export to China, its largest trading partner had declined over the years. Pakistan Business Council blamed on the poor negotiation on FTA with China where its jewellery, cotton, rice and sugar were imposed with 20% higher tariffs (Zhang, Alon and Lattemann (eds.), 2018).

Table 8 shows that the term "port" has the highest weightage of 27.40 throughout the corpus whereas "Bangladesh" has the lowest weightage of 2.61.

4.3.3. Port

Discussion on the development of seaports is largely dominated by the MSRI with some considerable focus on the dry port of Khorgos Gateway in Kazakhstan. Adopting network simulation approach, Shibasaki, Tanabe, Kato and Lee (2019) discovered that the Gwadar Port in Pakistan has the capability in becoming the gateway to Central Asian countries as well as China's Xinjiang region, not only due to its close proximity but also its capacity to handle rising volume of containers, provided that the railway network is completed. This is supported by Panneerselvam (2017) whom reported that Gwadar Port's long-term master plan expects the port to increase its throughput from 42-65 million tonnes to 321-345 million tonnes in the year 2021 to 2055 as it sets to be the major transit route for the Chinese trade of oil and gas.

Feng, Liu and Zhang (2019) proposed a port alliance between MSRI ports as it may enhance overall capabilities of each port within the region while opening up the possibility of a new ocean transport network.

Table 8 Word Weightage for *Trade* Corpus

Word/Term	Weightage	Word/Term	Weightage
port	27.40	malaysian	2.76
export	20.80	gas	2.75
infrastructure	16.80	integration	2.74
network	16.50	gwadar	2.73
corridor	14.40	gvc	2.70
transport	14.20	vertical	2.70
investment	13.10	myanmar	2.69
cost	13.00	colombo	2.69
ofdi	12.60	textile	2.62
economy	12.30	bangladesh	2.61

Figure 7 Word Cloud for *Trade* Corpus

Upgrade and construction of seaports however, perturbed other BRI countries on their competitiveness in global trade. Krishnan and Sriganesh (2017) reviewed the development of seaports in Malaysia and Sri Lanka and how it may affect Singapore's export-oriented economy. As in the case of Malaysia, the authors opined Singaporean ports activities due to its large capacity making it one of the two leading ports in the Southeast Asia. In fact, Melaka Gateway, situated in the north of Singapore, will have a storage capacity that is lesser than one-tenth of Singaporean ports, thus making it unlikely to be a threat. The authors, however, is unclear whether the Hambantota Port in Sri Lanka could create a new competition despite its strategic location in the IOR considering the controversies clouding the development of the port at the time of writing.

Fardella and Prodi (2017) expressed the same concern over the development of the Port of Piraeus in Greece and how it may affect the Italian economy. As China plans to transform the Piraeus Port into its main gateway to Central and Eastern Europe, the China-funded Budapest-Belgrade railway line would be connected to the port to increase connectivity. The authors claimed that Italian ports of Venice and Trieste are countering the growing competition as the Port of Venice plans to expand its capacity with a new offshore port while Port of Trieste is increasing its connectivity to the northern Italy and the rest of Europe via a new railway network.

4.3.4. Export

As BRI promised unimpeded trade, many studies had evaluated its impact on trade for participating countries. Cui and Song (2019) discovered that certain Chinese sectors would experience increase in export, particularly in textile, chemical rubber and plastics as well as the

ferrous industry. Besides, almost all sector will boost its exports if China pursues FTAs with participating countries.

Meanwhile, Leng *et al.* (2020) explored the trade potential for Chinese wind energy products and found out that although export grew by 392.4% from 2007 to 2017, the market is rather concentrated in ASEAN countries, South and Western Asia. Through the win-win concept, with every 1% increase in GDP for importing countries, China's export of wind energy products will increase by 0.93%.

On top of that, de Soyres *et al.* (2018) showed that BRI could substantially reduce shipment times and trade costs by 3.2% and 2.8% respectively among the BRI countries. For global trade, 2.5% of shipment times and 2.2% of trade costs is expected to decline.

One point to highlight is the lack of focus on BRI's impact on trade for individual country or region apart from Europe (Garcia Herrero and Xu, 2016; Fardella and Prodi, 2017; Holslag, 2017). Many studies were centred on China's trade potential with BRI countries (Cui and Song, 2018; Dumor and Li, 2019; Yu, 2019; Leng *et al.*, 2020, Cieślik, 2020) or took a macro view on the impact of trade for all BRI countries. Although most results pointed out that global trade would benefit from BRI, a granular view would help evaluate the presence of win-win cooperation for participating countries.

4.3.5. Infrastructure

Infrastructure connectivity is the second pillar outlined under BRI. As mentioned earlier, improved infrastructure is one of the key elements in trade facilitation. However, Zhang, Li, Liu and Cheng (2019) discerned that countries like the Philippines, Pakistan and Vietnam have lower level of infrastructure connectivity compared to its Asian counterparts and require special focus to optimise trade facilitation. Demand for infrastructure investment between 2016 to 2020 in major Asian countries

require approximately USD6.5 trillion meanwhile AIIB and Silk Road Fund had the funding capacity of USD1.2 trillion and USD40 billion respectively. Other entities investing in Asia include the World Bank and Asian Development Bank (ADB) with a total of USD150 billion cumulatively as well as Japan which had long been a major investor in the region with total investment amounting to USD110 billion (Yang, Huang, Huang and Chen, 2020).

However, researchers had continuously proved that export activities will increase through trade facilitation that consists of efficient border management, enhanced technological adoption and improvement in transport infrastructure (Ramasamy, Yeung, Utoktham and Duval; 2017, Zhang, Li, Liu and Cheng, 2019; Ramasamy and Yeung, 2019). Thus, China and host countries should not only focus on hard infrastructure but also soft infrastructure to ensure smooth and unimpeded trade. Training, leadership and knowledge sharing may help as in the case of Malaysia's port alliance with China highlighted in the earlier section.

5. Conclusion

This study answered the question on the main themes and issues discussed by relevant studies on BRI, in the context of geopolitics, environment and trade. Besides, this study went further by highlighting the absence of certain themes that are deemed pivotal in the development of BRI.

Within the geopolitical aspect, the culmination of PSR in the Arctic is increasingly scrutinised by scholars. China's claim as the near-Arctic state may degrade its goals within the region and cause further rift with the US. Although China is welcomed by Russia for the NSR, it is worth noting the trade sanctions faced by Russia from EU and it is worth exploring how ABEC may come into effect.

The *environment* corpus highlighted several initiatives and challenges ahead for BRI in ensuring low carbon emissions and green development. China should promote the construction of green infrastructure through its technological capabilities in BRI countries and reduce the consumption of cement, iron and steel while further reducing carbon emissions.

Discussion on trade mostly focused on several flagship projects in BRI such as the Gwadar Port from CPEC, MSRI and the massive energy trade that China inked with Russia. However, most studies tend to focus on the impact of trade on the Chinese economy as compared to any individual country or as a region. The lack of studies or discussion on this will not help to justify the win-win cooperation but rather portrayed the BRI as China-centric development plan.

Notes

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Afterword