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# SOCIAL, ECONOMIC, AND ENVIRONMENTAL IMPACTS OF THE ONE BELT ONE ROAD INITIATIVES



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## ABSTRACT

The One Belt One Road Initiative (OBOR) by China presents a grand vision to the world that aims to foster cooperation among different countries in various fields such as global trade, international relations, infrastructure development, education, and technology. Also known as the Belt and Road Initiative (BRI), it comprises a network of roads, railways, and sea routes, all geared toward the development of humanity. The purpose of this research is to analyze some of the significant impacts of this massive project in terms of social, economic, and environmental aspects. Through the exchange of culture, sports, education, and international relations on six economic corridors, the BRI has the potential to create substantial economic benefits. The project also prioritizes environmental sustainability through a green BRI approach. All the quantitative and qualitative data are extracted from different research papers/reports, published books, and some online based data portals. It has been shown that the OBOR/BRI seeks to connect the world and foster peace, whilst its implementation may face significant challenges. Nonetheless, it presents new opportunities for people and may usher in a new era of globalization.

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## INTRODUCTION

The Belt and Road Initiative (BRI), also referred to as One Belt One Road (OBOR), is a massive infrastructure development project that aims to transform and enhance existing structures of roads, ports, transportation systems, airports, economies, skyscrapers, technologies, and more in various regions of the world. Its scale is so significant that it is considered the world's largest man-made infrastructure development project (Tan et al., 2019). The initiative is a historic effort by the People's Republic of China to connect people globally, with the ultimate goal of changing the world map. Huping Shang has described the BRI as a combination of two extensive projects: the overland Silk Road Economic Belt and the Maritime Silk Road of the 21<sup>st</sup> Century. In September 2013, it had been proposed by the People's Republic of China President Xi Jinping in Kazakhstan and later in Indonesia, respectively (Wang et al., 2020). On that day, the president intends to build an overland silk road by promoting various policy management, connectivity of roads, free trading, currency convertibility, and reinforcement to tie among people (or people-to-people) (Shang, 2019; Sarker, et al., 2018). There has been a significant amount of research carried out on the Belt and Road Initiative (BRI) since its proposal in 2013. Researchers have analyzed various aspects of the project, including its environmental impacts, economic development potential, and theoretical dimensions. The researchers like Haoguang Liang, Yaojun Zhang, and Huping Shang analyze theoretical aspects of the BRI project in different dimensions. The BRI has sparked discussions on the future of global connectivity and infrastructure development, as well as the role of China in shaping these processes. Some researchers have also explored the potential for

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the BRI to advance sustainable development in the context of the evolution of humankind, including through the creation of green and digital silk roads (Liang & Zhang, 2019).

It is interesting to see how different researchers have analyzed the Belt and Road Initiative from diverse perspectives. While some have focused on its economic impacts, others have looked at its cultural and social dimensions. Md. Nazrul Islam's perspective on the culturalization of the BRI project sheds light on how this initiative can bring people from different nations and societies together by promoting people-to-people interaction and communication (Afzaal, 2019). Similarly, other scholars have looked at various issues within the framework of the BRI, such as the philosophy and culture of a society, economic development, environmental sustainability, social responsibility and ethics, and judiciary and law enforcement services (Shan et al., 2018). This indicates the complexity of the BRI project and the diverse aspects that need to be considered to ensure its success.

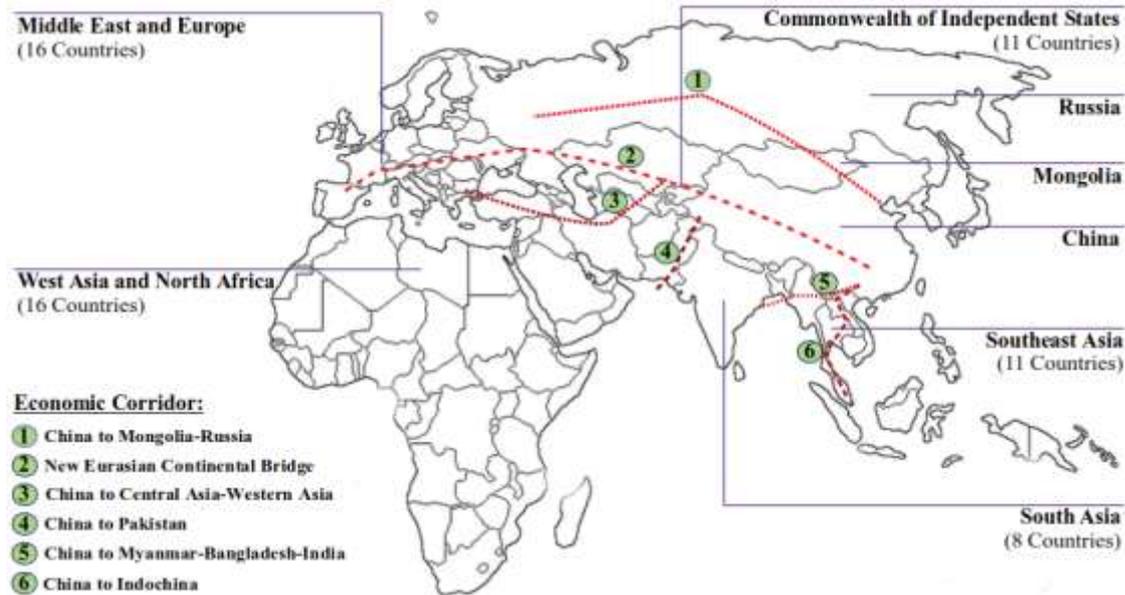


Figure 1. At a glance economic corridors and member countries of the BRI project (Wong & Jia, 2017; Consultants, 2016)

The 21<sup>st</sup> Century Maritime Silk Road is an important component of the BRI, which aims to connect countries and regions through a network of infrastructure projects and trade agreements. The Maritime Silk Road specifically focuses on developing port infrastructure and logistics networks to facilitate maritime trade and transport between China and other countries in Asia, the Middle East, and Africa. It involves the construction and upgrading of ports, shipping lanes, and other maritime infrastructure, as well as the promotion of trade and investment in related sectors such as shipping, logistics, and energy. Additionally, their work also reveals that international relation among different nations has been influenced by China's role. The Belt and Road Initiative has a global reach, with over 65 countries (geographical units are represented in Figure 1) officially participating in the project as of 2021. Table 1 exhibits some significant aspects of the BRI initiatives (Chua, 2017).

Table 1. An abstract view of the Belt and Road Initiative (Chua, 2017)

Scope	Description
3 Round	China's 3 <sup>rd</sup> round opening up following the progression of economic or business zones and effective accession with the world trade organization (WTO)
5 Vital Scopes	There are five significant scopes as follows: trading, financial integration, coordination of policies, connectivity, and interconnection between people all over the world
6 Economic Corridors of Trading	Establish six international trading corridors for economic development, such as China to Indochina Peninsula (including six Association of Southeast Asian Nations member nations - Singapore, Thailand, Malaysia, Cambodia, Vietnam and Laos (Jinbo, W., 2019), China to Myanmar-Bangladesh-India, China to Pakistan, China to Central and Western Asia, New Eurasian Land Bridge (or New Eurasian Continental Bridge), and China to Mongolia-Russia
30% of GDP	Accounted for 30% of gross domestic product (GDP) with respect to 63% (approximately) of the world population
40 > Countries	Cooperation agreements have been signed by more than 40 countries and different international organizations with China
65 Countries	Sixty-five countries, as presented in Figure 3, connect with the BRI project (approximate 4.4 Billion of the world population)
USD 953 Billion	China's trade value reached approximately USD 953 Billion with the BRI member countries in 2016, while China's total trade was approximately 25.7%
8,158 Contracts	In 2016, around 8,158 contracts signed by the Chinese enterprise with 61 countries around the world

According to geographical locations, the BRI member countries are categorized into five regions: (i) East and Central Asia, and Commonwealth of Independent States (CIS), (ii) Southeast Asia, (iii) South Asia, (iv) West Asia, and North Africa, and (v) Central and Eastern Europe, as listed in Table 2 (Wang et al., 2020).

Table 2. Five geographical regions according to the member of BRI nations

Geographical Regions	Name of the Nations
East and Central Asia, and CIS Nations	Belarus, China, Russia, Mongolia, Kazakhstan, Turkmenistan, Kyrgyzstan, Azerbaijan, Tajikistan, Georgia, Ukraine, Armenia, Moldova, Uzbekistan
Nations of Southeast Asia	Brunei, Malaysia, Singapore, Indonesia, Thailand, Philippines, Cambodia, Vietnam, Myanmar, East Timor, Laos
Nations of South Asia	Bangladesh, India, Pakistan, Afghanistan, Nepal, Sri-Lanka, Bhutan, Maldives
West Asia and North Africa Nations	Bahrain, Saudi Arabia, Qatar, United Arab Emirates, Jordan, Oman, Turkey, Iran, Israel, Kuwait, Egypt, Iraq, Yemen, Lebanon, Palestine, Syria
Central and Eastern Europe Nations	Bulgaria, Poland, Czech Republic, Croatia, Slovakia, Hungary, Latvia, Herzegovina, Lithuania, Montenegro, Slovenia, Estonia, Albania, Serbia, Romania, Bosnia, Macedonia

The BRI (or One Belt One Road) project initiates connecting (or networking) the world based on land or sea routes, as shown in Figure 2. Its significance cannot be excluded due to various active roles in the development of financial growth, networking, and mutual peace among different countries. This project connects major Asian nations, such as Singapore, Bangladesh, Myanmar, Brunei, Sri-Lanka, Cambodia, through some economic corridors, interconnected pipelines of oil and gas, and ports (Ouyang, 2017). The key enthusiasm of this potential research work is to scrutinize or analyze different perspectives of the OBOR initiative in terms of economic development, environmental issues, and multi-cultural societies, which imposes new challenges and opportunities for future globalization. Additionally, this work focuses on how the development of the BRI project would be beneficial for humankind.



Figure 2. Roadmap of the One Belt One Road (OBOR) initiatives (Loya, 2019)

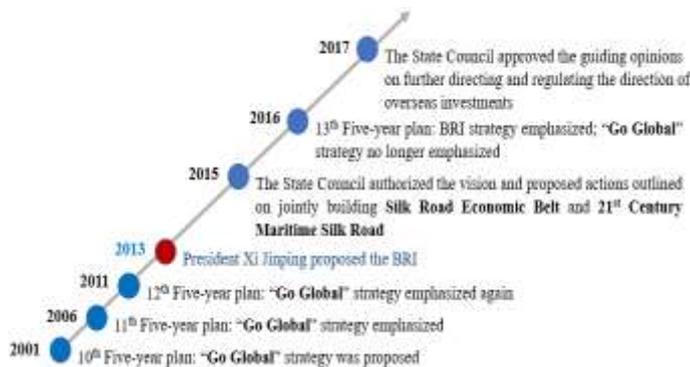


Figure 3. China’s policy: Go-Global to BRI (Zhou et al., 2018)

The sections of this research work are arranged as follows: Section one provides a basic introduction of the Belt and Road Initiative (BRI) project, including geographical regions and the roadmap of the One Belt One Road (OBOR) initiatives. In Section two, Discussions: the background of this study is briefly described, including 5 routes of BRI initiative, and economic corridors, along with prime data sources, crucial impacts of the BRI project on social, economic, and environmental issues, addresses significant opportunities and challenges of the world's most ambitious project in terms of globalization. Finally, last Section concludes the paper with the future direction of the work.

## DISCUSSIONS

### Background of Study

Two mega-projects, the Silk Road Economic Belt and the 21<sup>st</sup> Century Maritime Silk Road, make up the Belt and Road Initiative (BRI) project, also known as One Belt One Road. The aim of this project is to achieve future globalization by connecting people all over the world, developing infrastructure, promoting global trade, and more. This marks the future roadmap of China's foreign policy, which was initiated in the early 2000s when China shifted its policy from "Go-Global" to "Belt and Road Initiative" (Shang, 2019), as shown in Figure 3. A comprehensive Chinese vision of the BRI project is presented in reference (BRI, 2017), which includes a description of five routes (including the Silk Road Economic Belt and the 21<sup>st</sup> Century Maritime Silk Road) and six economic corridors. These are presented in Table 3 (Shang, 2019) and Table 4 (Wong, & Jia, 2017), respectively. The geographical location of the Belt and Road Initiative project economic corridors is illustrated in Figure 1.

Table 3. Five routes (including 3 land and 2 sea routes) of the Belt and Road Initiative (BRI, 2017)

Rout	Description
Silk Road Economic Belt	China (Northeast China) to Europe passing through the Baltic Sea (a branch of the Atlantic Ocean) via Russia and Central Asia
	China (Northwest China) to Central Asia, West Asia to the Mediterranean Sea (connecting the Atlantic Ocean), and the Persian Gulf
	China (Southwest China) to the Indian Ocean via the Indochinese Peninsula (or Mainland Southeast Asia)
Maritime Silk Road	From coastal ports of China passing through the Strait of Malacca (connecting the Pacific Ocean and the Indian Ocean) by crossing the South China Sea to reach the Indian Ocean and extends to the European region
	Crossing the South China Sea over the coastal ports of China and extends routes to the Southern Pacific Ocean

Table 4. Six economic corridors of the BRI project (Wong & Jia, 2017)

Economic Corridor	Status	Operations/Activities
China to Indochina	Operational	The Association of Southeast Asian Nations (ASEAN) has been made their agenda to invest in infrastructure development of member nations railway and highway networks. The BRI also supports raising capital for the fund.
China to Myanmar-Bangladesh-India	Semi-Operational	Oil and gas distribution pipelines are operational in between China and Myanmar. But it is challenging and requires a long-term mission for an extension to India.
China to Pakistan	Operational	A significant amount of investment has been used for infrastructure development.
China to Central Asia-Western Asia	Non-Operational	A large amount of investment and long-term ambition is required for infrastructure enlargement or broadening to operate this economic corridor.
New Eurasian Continental Bridge	Operational	Many infrastructures are already being developed (pre-BRI) and used by many logistic organizations for different purposes, such as trading, communication.
China to Mongolia-Russia	Semi-Operational	Infrastructure development investment has been increased, and primarily it is a commodities route.

Furthermore, six communication pathways explain in brief, including highway roads, railways, sea transportation, oil, and gas distribution pipelines, aviation (or Aircraft), and aerospace networking among the BRI member nations or countries. The BRI scheme mainly focuses on five key areas as follows (Brown, 2019): (i) financial integration, (ii) global trade and investment, (iii) policy coordination among the BRI member countries, (iv) multi-cultural society, and (v) connectivity, to accomplish this project goal. According to (Sarker et al., 2018), PricewaterhouseCoopers (PwC) estimated that the BRI member countries require at least USD 5 Trillion for infrastructure development from 2016 to 2020. The Asian Development Bank (ADB) also estimated that only Asian countries such as Bangladesh, Myanmar, and Cambodia require eight trillion U.S. Dollar (USD) for their infrastructure development and expansion (He, 2017). Additionally, the ADB estimated that the BRI project would cost about USD 22.6 Trillion by 2030 (Brown, 2019).

In 2018, the establishment of the One Belt One Road Brunei-China association was announced in Brunei Darussalam, highlighting the importance of the OBOR project regarding socio-economic development in the region (Admin, 2022). However, this research work explores both positive and negative impacts of the BRI development project in various dimensions, such as financial investment policy, infrastructure development challenges and opportunities, and globalization, among others. For this analysis, all data were collected from various publicly available secondary sources, such as Google Scholar, ScienceDirect, and Springer databases, using relevant keywords such as OBOR, China, BRI, Belt and Road Initiative, Maritime Silk Road, 21<sup>st</sup> Century Maritime Silk Road, Economic Corridor, Global Economy, Challenge, and Opportunity of BRI, among others, to gather authentic information. Additionally, some of the latest information has been obtained from different reports (government reports, newsletters) for better understanding.

### Impacts of the BRI Project

In this section, three significant impacts of the BRI project have been explored, which are based on the vision of connecting people (or people-to-people) all over the world, and on distinct perspectives such as economic development through local and global trade, natural resource distribution and environmental sustainability (including resource sharing, proper distribution, safety, and pollution reduction), and the promotion of a multicultural society through culture, education, medicine, and sports. Society can be significantly impacted by each of these dimensions, either positively or negatively.

### Social Impacts

A holistic view to achieve sustainable development in 2030 for the implementation of the BRI has been proposed by the

People's Republic of China. The BRI project has significant social impacts on the member countries. In terms of peace, one another national sovereignty, political independence (territorial integrity of nation or state), propriety, and social role and status should be esteemed by all member nations. For the establishment of a civil society, multicultural platforms, such as exchange education, sports, culture, health, and historical heritage, are required to be utilized for people to exchange and cooperate. Moreover, international cooperation or relation with a higher ethical standard is strengthened by the BRI project (OECD, 2018).

The construction of roads, railways, ports, and other facilities create jobs for local people, which leads to economic growth and poverty reduction. However, there are also negative social impacts of the BRI project. One concern is that the infrastructure development may displace local communities and disrupt traditional ways of life. Additionally, some argue that the influx of foreign workers to construct these facilities may lead to the exploitation of local workers and weaken labor rights. Some analysts worry that member countries may face difficulties in repaying the loans obtained from Chinese banks, leading to economic instability and social unrest (Jones & Hameiri, 2020). It is crucial to ensure that the projects are sustainable and beneficial for all parties involved to avoid such issues.

### **Environmental Impacts**

In the context of the serious environmental challenges faced in the 20<sup>th</sup> Century, environmental scholars have been paying close attention to the potential technological impacts on the environment. Unfortunately, the 21<sup>st</sup> Century has already seen the continuation of negative environmental consequences such as rising carbon emissions, global warming, and an accelerated greenhouse effect. Against this backdrop, China has embarked on a historic project known as the BRI, which seeks to change the existing infrastructure of the world's road and transportation systems. However, the BRI initiative also promotes the concept of a "green BRI," which emphasizes the influential factors of climate change resulting from the infrastructure development for transportation and energy systems. The main objective of the Green Belt and Road Initiative is to be followed by an eco-friendly environment to prevent air, water, and land pollution and ensure resource-efficient development. Key areas of transportation infrastructure development focus on land, water, and air traffic to improve transportation bottlenecks and reduce carbon emissions. Both renewable smart energy and traditional sources of energy, including coal, oil, gas, wind-power, hydro-power, and solar-power, are considered in the development of the BRI project (Zhou et al., 2018). However, it is challenging to identify suitable infrastructure and resources for a particular region of a country. The development of infrastructure in certain areas may have negative impacts on the environment in the short or long term, such as:

- Transportation – Railways, highways, and ports (cross-border networking) infrastructure along with some of the BRI member nations may be increased carbon emissions and air pollution due to the construction of new transportation infrastructure.
- Energy - Power or electricity transmission, distribution, production systems, oil and gas pipelines connectivity may lead to environmental degradation through pollution and habitat destruction. The BRI project involves the construction of many new coal-fired power plants, which can contribute to air pollution and greenhouse gas emissions.
- Water management - Bridge, dam, and port development are the potential issues for water pollution as well as water distribution and allocation. These projects can disrupt natural water flows and negatively impact aquatic ecosystems.
- Waste management - Industrial waste, construction waste, and city waste.
- Technology - radiation, technological hub, smart-gadget, communication channel and digital waste (electronic waste or e-waste).

### **Economic Impacts**

A new dimension in China's financial development and engagement with international trading within many countries is imposed by the BRI project. It confines economic growth based on the six economic corridors, as presented in Table 4 and Figure 1, as follows (Ramasamy et al., 2017):

- The *China to Mongolia-Russia* is a semi-operational economic corridor, which extends and makes efficient connectivity based on Mongolia's Steppe Road development and Russia's Eurasia Land Bridge renovation projects.
- The *New Eurasian Continental Bridge* economic corridor connects Europe and China via an international railway network, which starts from China's Jiangsu province to South Holland province (Rotterdam) in the Netherlands. The Xinjiang rail lines crossed over many nations, such as Belarus, Russia, and Poland, joining a European network of the railway.
- The *China to Central Asia-Western Asia* economic corridor connects with the Xinjiang railway network, which extends connectivity with many nations, such as Tajikistan, Iran, Uzbekistan, Kazakhstan, Turkey, etc., throughout Central Asia and West Asia over the Mediterranean Sea and the Arabian Peninsula.
- The *China to Pakistan* economic corridor associates the northwest territory of China (Xinjiang) with the Gwadar port of Pakistan.
- The *China to Myanmar-Bangladesh-India* economic corridor requires significant cooperation with each other to share common borders.
- The *China to Indochina* peninsula economic corridor connects China to five different nations of the Indochina peninsula. Hence, this corridor enlarges its connection to Singapore, Malaysia, and Indonesia.

An abstract view of trading rules among the BRI member countries in the Global Trade Enabling Report 2016 is provided by the World Economic Forum (WEF). The enabling trade index (ETI) is formed with seven pillars: (i) national (domestic) market access policy, (ii) international (foreign) market access policy, (iii) transparent and efficient border management administration, (iv) availability of infrastructure for the transportation system, (v) efficient and convenient transport services, (vi) accessibility and usability of information and communications technologies (ICTs), and (vii) systematic operating environment, according to (Ramasamy et al., 2017). The trade facilities among the BRI member countries are being improved through the establishment of several economic corridors across the world. For instance, China to Indochina economic corridor has a total trading value of USD 6,070 Billion, with intra-corridor trading accounting for about USD 1,238 Billion. Analysis results indicate that China is the primary destination for export goods and products from some member nations, such as Cambodia exporting 5% of its export products to China, whilst Laos exports over 25.7% to the same destination, as reported in 2015 (Ramasamy et al., 2017). Similarly, China also exports products to these countries. The China to Myanmar-Bangladesh-India economic corridor has made China a significant source for imports of products and goods trading.

A large amount of financial investment is needed to build a network of roads, ports, railways, and other hard and soft infrastructure over sixty nations or countries for the BRI project. This is the key objective of China's foreign and economic policy (Djankov et al., 2016). Funds for this project have been allocated to funding bodies such as the State Administration of Foreign Exchange, the Export-Import Bank of China, etc. in 2015, as listed in Table 5 (Sarker et al., 2018). Table 6 (OECD, 2018) provides a comparative summary of the required estimation of global infrastructure development projects based on some significant research reports.

Table 5. The BRI project funding or investing mechanism (Sarker et al., 2018)

Banks	Institutions	Funding Mechanism (USD Billion)		
		Authorized Capital Size	Yearly Lending (Recent)	Approximate Amount of Lending Yearly (prior 2020s)
Multifarious Banks	Asian Infrastructure Investment Bank	100 Billion	1.7	10 to 15
	New Development Bank (NDB)	100 Billion	1 to 1.5	5 to 7
	Silk Road Fund (Chinese government investment fund)	40 Billion	2 to 3	2 to 3
	Commercial Banks	The approximate amount of annual lending is USD 90 Billion by the four banks in 2016		
Policy Banks	China Development Bank (CDB)	---	15 (2015)	---
	Export-Import Bank of the Republic of China	---	24 (2015)	---

Table 6. Comparison of estimated needs of global infrastructure investment (OECD, 2018)

Source	Scope	Actual/Expected Yearly investment (USD Trillion)	Investment Require (USD Trillion)		
			Duration	Total	Per-Year
(Amar et al., 2016)	Transmission, generation and distribution of power, primary source of energy supply, demand of energy and efficient distribution, water and sanitation, and telecommunication	3.4 (2015)	2015 to 2030	75 to 86	5 to 6
(NCE, 2014)		---	2015 to 2030	96	6.4
(OECD, 2017)		3.4 to 4.4 (2017)	2016 to 2030	95	6.3
(Hub, 2023)	Connectivity - road, airport, railway, generation of electricity and efficient transmission and distribution, management of water, and telecommunication	2.3 (2015) to 3.8 (2040)	2015 to 2040	94	2.9 (2015) to 4.6 (2040)
(Woetzel et al., 2016)	Transportation (railway, airport, and road, port), telecommunication, water, and energy	2.5	2016 to 2030	49	3.3

### Opportunities and Challenges of the BRI Project

Many opportunities are offered by the BRI (Belt and Road Initiative) in different domains, such as investment and trade among different countries and companies (either private or public organizations), peace among nations, cooperation, and collaboration with BRI member countries. In this section, some of the key opportunities are addressed as follows:

- Allowing access to natural resources, such as gas, oil, energy, through local and international cooperation among member countries of the BRI based on their resources demand, production, and distribution (OECD, 2018).
- Extensive international cooperation increases cultural exchanges between member countries in terms of science, technology, sports, education, medical science, traditional culture and history, Chinese medicine, tourism, food, etc. (OECD, 2018).
- Contractors or developers from different nations allows performing joint ventures project to increase partnership and collaboration activities, such as engineering's of the China state construction has been started a joint project in

the United Arab Emirates (UAE) with Korea's Ssangyong Engineering and Construction corporation (Woetzel et al., 2016).

- The infrastructure of the transportation systems gradually improves in the BRI countries and corridors based on the multi-modal transportation mechanism, which incorporates waterway, railway, airway, and expressway for efficient services. Consequently, it will connect all the major routes and ports of entry to increase connectivity (OECD, 2018).
- The BRI project will create more job opportunities in a local and international market, which also imposes legal law enforcement for workers.

New opportunities in various domains of everyday life will be brought by the Belt and Road Initiative after the successful completion of the target and running projects. However, key challenges are associated with the development of the world's biggest project, such as:

- In terms of infrastructure development in different member nations or countries of the BRI project, it is challenging to measure the absolute size and scale of structure and design, while funding plays a key role (Aris, 2016).
- Infrastructure development requires adequate time to accomplish, and without completion of the project, no economic return will get from it (The Economist 2015). Hence, future funding for development will face difficulties in running projects smoothly. Therefore, it is necessary to find potential investors (He, 2016).
- In the BRI member countries, geography and topography are not the same, which makes it difficult for a smooth transportation system. Developers are required to consider some factors during planning, designing, and developing routes, such as a high mountain, densely forest, distance, high and low topography, etc. (Sarker et al., 2018).
- International border security is a major challenge in neighbouring countries. It will bring new issues to manage internal and external national and international security (Pop, 2016).
- In the context of legal regimes practiced over the BRI member regions, there are some significant difficulties arise, which include the common law of Singapore and Malaysia, Islamic law in the Middle East, and Central Asia continental law (Wong, & Jia, 2017).

## CONCLUSIONS

A new path is brought to the world by the historical project of China, which offers opportunities for sharing development and prosperity. Chinese companies can benefit from this mega project through six economic corridors, while companies from around the world, whether public or private, can gain opportunities for local and international trading of goods and products. This project has the potential to connect people and nations, paving the way for future globalization. However, there may be challenges during the development phase due to financial difficulties and social and environmental issues. Despite this, the Belt and Road Initiative has the potential to create a peaceful civil society worldwide, with multicultural nations, a standard and secure lifestyle, open national and international job markets, water conservation, efficient resource utilization, multinational business models, and more. However, the limited availability of data regarding social and environmental perspectives is a challenge due to restrictions imposed by project developers or companies, partial completion of projects, and national rules. Future work is needed to explore more in terms of data availability in different domains.

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