

China-Indonesia cooperation in maritime infrastructure under the Belt and Road initiative (2013–2019)

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Abstract. Owing to a severe shortage of capital, technology and relevant equipment, Indonesia's inadequate and backward maritime infrastructure has seriously constrained its socioeconomic development. The Jokowi government has pursued a maritime-oriented economy, developed marine resources, and drawn up plans for maritime infrastructure construction. China and Indonesia enjoy complementary strengths, and cooperation in maritime infrastructure has become a strategic consensus between the two countries' leaders. Driven jointly by both governments, China-Indonesia cooperation in infrastructure—centered on port construction and its role as a hub linking inland and maritime transportation, as well as hydropower and utility networks—has been incorporated into the bilateral maritime cooperation mechanism, advancing connectivity between China and Association of Southeast Asian Nations (ASEAN). Nevertheless, China's international cooperation in maritime infrastructure in Indonesia faces competition and challenges from Japan, the United States, Singapore and the European Union.

Keywords: China–Indonesia, maritime infrastructure cooperation, maritime economy

1. Introduction

In the early 21st century, littoral countries around the world adjusted their marine policies one after another, formulated blue ocean development strategies, cultivated emerging marine industries, and developed the marine economy, aiming for sustainable development through integration of land-sea areas. Joko administration Indonesia proposed "Blue Ocean Economy" strategy in order to realize its aspiration as a "Global Maritime Fulcrum", leveraging its geographical advantages, Indonesian government is devoting to constructing ports, shipbuilding, and maritime transportation, thereby boosting the development of Indonesia's marine economy. Cooperation between China and Indonesian on maritime infrastructure effectively links the "Belt and Road" initiative with the "Global Maritime Fulcrum" strategy, making Indonesia a key node in the "Belt and Road" initiative. China's participation in Indonesian maritime infrastructure is an important starting point for China's 21st-century "Maritime Silk Road" construction. Indonesia lacks construction funds, marine talent and technology, resulting in outdated and underdeveloped marine infrastructure. Indonesia's cooperation with China in building marine infrastructure promotes the internationalization of its seaports, stimulated maritime shipping, developed coastal industrial parks, enhanced marine industries, improved its lagging infrastructure, and strengthened connectivity between China and ASEAN.

2. The current situation of Indonesia's maritime infrastructure

Indonesia is strategically located at the intersection of the Pacific and Indian Oceans, controlling crucial maritime routes such as the Strait of Malacca and the Sunda Strait, giving it an extremely important geographical position. Additionally, as the world's largest archipelagic country, Indonesia consists of 17,508 islands, with three-quarters of its territory surrounded by waters. It is rich in marine resources and water transportation with connectivity the coastal regions of major islands in eastern and western Indonesia, playing a significant role in the socio-economic linkage and interactions within the country [1]. Furthermore, Indonesia has the largest population among ASEAN countries and is home to the world's largest Muslim population. As the largest economy in ASEAN, sectors such as marine fisheries, offshore oil and gas, and maritime transportation are crucial pillars of Indonesia's national economy. According to official statistics, revenue from Indonesia's maritime resources accounts for approximately 22% of its GDP with potential investment exceeding \$25.5 billion, and gross value of maritime production is expected to reach as high as \$1.2 trillion in the future [2]. Hence, Indonesia's development is inseparable from ocean. However, due to the government's long-term neglect of investment in marine infrastructure as well as a lack of funds and maritime technology, the backwardness of its marine infrastructure has become a significant factor constraining Indonesia's development.

To begin with, the insufficient number of modern ports, deep-water quays, storage facilities, and large cargo vessels had severely hindered the growth of Indonesia's import and export trade. Approximately 45% of global cargo transportation must pass through Indonesia's territorial waters. However, the country primarily was dominated by small and medium-sized ports with severely outdated equipment, resulting in low efficiency in cargo handling and ports and docks supporting facilities that lag far behind those of Singapore in the same region, and even fall behind Malaysia and Thailand, being roughly on par with countries like Vietnam and the Philippines. To illustration, Indonesia had only 39 berths with capable vessels over 10,000 tons, compared with 56 tons in Malaysia, 65 tons in Singapore and 10 tons in Vietnam in 2005 [3]. In terms of cargo throughput for ASEAN countries in 2011, Indonesia recorded 93.25 million tons, compared to Singapore's 324.22 million tons, around 3.4 times that of Indonesia, and Malaysia recorded 208.69 million tons, equivalent to 2.2 times that of Indonesia. Although Indonesia has upgraded and expanded some port and wharf facilities, which still cannot meet the enormous demand for maritime transport. The large cargo vessels at Tanjung Priok Port and Surabaya Port in the capital Jakarta primarily were mostly old vessels or imported second-hand ships as Indonesia lacked the capability to construct large ships. Additionally, Indonesia' port faced several challenges, such as low customs clearance efficiency, outdated management and increasing congestion resulted cargo ships consuming in long times for wait in line to enter ports and delaying in delivery goods, and there was a remarkable pressure from cargo backlogs and port storage. Consequently, the large quantity of commercial vessels had to rely on nearby ports of Singapore or Malaysia for transshipment, causing Indonesia to endure huge economic losses.

Secondly, Indonesia's inadequate maritime transportation facilities, poor inter-island water and land connections and high maritime logistics costs have caused Indonesian domestic products to lose their competitiveness in the international shipping market. Congestion at port, insufficient power supply and inconvenient inter-island transportation have led to difficulties in logistics and expensive shipping costs cargo. In Indonesia, 90% of logistics relies on exorbitant land transportation with shipping costs accounted for 30% of total revenue, which was higher than the total cost of direct imports [4]. According to World Bank data, Indonesia has the highest logistics costs in East Asia, accounting for 24.6% of Indonesia's GDP [5]. The prices of imported items such as oranges and garlic from China and beef from Australia were cheaper than those of locally produced goods in Indonesia. The freight cost from Padang to Jakarta was three times higher than the

freight cost from Jakarta to Singapore [6]. The selling price of cement in Papua in the easternmost province of Indonesia was ten times that on Java Island [7]. The weak maritime infrastructure has severely restricted the development of Indonesia's marine economy, hampered the growth of marine industries and international shipping sector, and hindered the potential of Indonesia's international maritime trade hub and commercial advantages.

Thirdly, the exploitation of ports in Indonesia is uneven and the momentum for hinterland industry growth is insufficient, which undermine the radiating effect of the port economy. Indonesia currently has 1,324 ports and terminals of various sizes, mainly concentrated along the coastline of Java Island and the Malacca Strait of Sumatra Island. The largest container and cargo port, Tanjung Priok Port in Jakarta, has more than 40 berths with an annual throughput capacity of 450,000 tons of cargo and 4 million TEUs, accounting for over 60% of the nation's total cargo import and export volume. East Java, which has a larger number of ports, is the most economically developed region in Indonesia, hosting 50% of the country's industrial zones. In contrast, medium and large-scale ports are scarce in the provinces of Kalimantan and Sulawesi Islands, and there are no medium or large ports in Papua Province and North Highland Province on the island of New Guinea, preventing large cargo ships from navigating through inland waterways.

The difficulties in transportation between islands, as well as between ports and inland areas in Indonesia result in low integration of marine economic resource advantages. In 2011, the Indonesian government planned to establish six major economic corridors (the Sumatra Economic Corridor, Java Economic Corridor, Kalimantan Economic Corridor, Sulawesi-North Maluku Economic Corridor, Bali-Nusa Tenggara Economic Corridor, and Papua-Maluku Economic Corridor). These economic corridors are based on the more developed port cities. However, some islands in eastern Indonesia, such as Maluku and North Maluku, remain isolated with economies of these islands are largely still in a self-sufficient, failing to benefit from national production and distribution networks [4].

In addition, Indonesia's maritime infrastructure construction has been constrained by insufficient funding and inadequate construction capabilities. Major marine infrastructure projects in Indonesia are primarily funded and constructed by the central government, with participation from private enterprises, local governments, and state-owned enterprises. Generally, national infrastructure investment should account for approximately 5% of Gross Domestic Product (GDP). According to a World Bank survey, the average infrastructure investment among Asia-Pacific countries reaches 7.2% of GDP. In contrast, Indonesia's infrastructure spending accounted for only 3.9% of GDP in 2012 and rose to just 4.5% in 2013 [8]. The Indonesian government faces a severe shortage of domestic construction funds, with even less allocated specifically to marine infrastructure. Statistics indicate that from 2005 to 2012, merely 1.5% of Indonesia's GDP was allocated by the central government for infrastructure construction. This low level of investment has led to the long-term lag in Indonesia's marine infrastructure [9].

The lack of technical capacity is another critical factor hindering the sustainable development of Indonesia's coastal and marine regions. The Indonesian government has neglected to support and develop marine technologies, mainly focusing on large-scale port construction centered around Tanjung Priok, primarily exporting raw materials such as oil, coal, and palm oil. Other ports handle only small volumes of dry or bulk cargo. Consequently, Indonesia has failed to establish new industries and marine industrial clusters centered on marine science and technology.

3. Indonesia's "Global Maritime Fulcrum" strategy and marine infrastructure development

To improve maritime infrastructure, the Indonesian government lifted the ban on private investment in the mid-1980s and subsequently removed restrictions on foreign investment in infrastructure projects in 1994. Following this, to promote maritime trade and enhance port services and management, Indonesia privatized container terminals and introduced foreign operators. The Indonesian Defense White Papers of 2003 and 2008 both emphasized on strengthening maritime infrastructure in order to give a privilege to enhancement of inter-island connectivity [10]. Indonesia's Sea Toll Road initiative mainly covers island-based infrastructure projects involving water supply, power, transportation, ports and public health facilities.

After Joko Widodo assumed office in 2013, he proposed the "Global Maritime Fulcrum" strategy, which involves building a maritime highway and developing large-scale commercial ports. The core of this strategy is infrastructure connectivity to promote cargo transport and trade improvement. It comprises three levels: the first, is inter-land connectivity within Indonesia, focusing on building infrastructure construction across Indonesia's major islands; the second is inter-island connectivity, involving the construction of ports, airports, and maritime routes between the islands; and the third is international connectivity, primarily aimed at building maritime infrastructure linking Indonesia with neighboring ASEAN countries, as well as extending eastward to China, South Korea, and Japan, and westward into the Indian Ocean, Mediterranean Sea, and Persian Gulf [11].

The Jokowi administration's strategical targets for expanding domestic funding and attracting foreign capital to accelerate the construction of three key sectors: the Indonesian maritime highways, deep-water ports, shipping, coastal road and rail networks. With associated hydroelectric and power facilities for inter-island connectivity, near-shore infrastructure, and the maritime highway. The administration had planned to enhance international commercial ports installation through purchasing vessels, upgrading shipyards, constructing modern facilities for containerized and bulk loading equipment, and establishing a logistic networks for ports. These efforts aim to make Indonesia as a strategic hub connecting the Pacific and Indian Oceans, thereby overcoming the isolated dilemma caused by geographic archipelago structure of over ten thousand islands [12].

In November 2014, President Jokowi emphasized the priority implementation of the "Global Maritime Fulcrum" at the ASEAN Summit, with a strong focus on developing marine infrastructure development. The construction of Indonesia's Global Maritime Fulcrum encompasses five key fields, including the promotion of maritime culture, maritime food sovereignty, marine infrastructure development, maritime connectivity, and naval defense capabilities. Specifically, Indonesia's maritime food relies on fishermen as its backbone to leverage their economic role; maritime connectivity refers to the establishment of a "sea highway" to interconnect various regions of the country; and marine infrastructure construction involves improving large-scale ports and deep-water terminals. And Indonesia's Global Maritime Fulcrum strategy stick to build sea highways, improving port infrastructure, and developing the maritime transportation industry. Indonesia promotes the construction of marine infrastructure and drives the related marine industries growth in order to elevate its economic developing level to upper-middle-income status with the goal of increasing Indonesia's per capita GDP from the current US\$3,592 to over US\$10,000 during his administration term [13].

In terms of specific measures, the Widodo administration was constructing new ports, expanding docks capacities, building large vessels, improving the shipping system, enhancing shipping efficiency, optimizing port facilities, simplifying port customs procedures, upgrading modern management at ports and docks,

enhancing the services of the shipping fleet, enlarging maritime transport routes, establishing a modern digital logistics connectivity system, strengthening inter-island connectivity.

Firstly, build new modern deep-water ports and expansion of new container terminals and port facilities. In 2013, the Indonesian's Joko government announced new PPP investment projects, including the construction of an international port from East Kalimantan to Malaysia with an investment of 123 million, and the expansion projects of Tanjung Priok Port, worth 1.78 billion, as well as expansion projects of both the Batang and Riau Port, totaling 800 million. It was planned that by 2017 the expanded Tanjung Priok Port's annual handling capacity would reach 15 million TEUs to reach the port's loading capabilities increasing doubly. In 2015, Joko administration allocated a fiscal budget for approximately 800 million US dollars for port construction, with plans to build or enlarge 24 ports with in three to four years his term through national budget and allocated funds so as to significantly enhance port handling capacity [14]. By the end of 2015, Indonesia's second-largest port company spent 1.35 billion Indonesian rupiahs to construct Sorong port, Jiqing port, and Zarate ports, as well as to expand Cirebon port and other major ports. Sorong Port was set to become a shipping hub in eastern Indonesia, strengthening economic ties between Indonesia and South Pacific regions such as Australia.

In November 2016, President Joko Widodo stated that during his tenure, 4,900 trillion rupiah would be invested in infrastructure development across the country, resulting in new highways, airports, and ports appearing in many regions [15]. The Indonesian National Development Planning Ministry indicated that it planned to invest US\$300 billion in infrastructure development before the end of President Joko Widodo's term in 2019 [16]. The Joko Widodo government also planned to invest US\$13 billion to complete the expansion and updating 29 ports by 2025, and focused on ports in Jakarta, Surabaya, and Belawan [17]. This included the construction of three major international ports: Karawang in West Java Province, Kuala Tanjung in North Sumatra Province, and Belitung Port in Bangka Belitung Islands [18].

Indonesia's state-owned port company had planned to build three deep-sea ports and expand 21 others within five years, including two global hub ports at Belawan and Bitung, as well as six main ports and distribution hubs capable of accommodating vessels carrying 3,000–10,000 TEU standard containers [19]. The Indonesian government planned to construct or renovate 41 medium-sized seaport terminals and 47 passenger boat quays and non-commercial logistics terminals, completed the plan of constructing 100 terminals in 2019. Centered on port construction, Joko administration was dedicated to boost the of prosperity port economies radiating to surrounding cities and regions, which were forming coastal economic belts. Simultaneously, Indonesian government was ambitious to developing Tanjung Priok Port into a new transshipment hub in Southeast Asia.

Secondly, optimize supporting facilities like port logistics and electricity as well as railways and highways in the port hinterland. In December 2014, the 4th Indonesia development and Port Planning Summit was held, where Indonesia economic experts pointed out that the government should not only streamline licensing procedures as soon as possible, but also expedite cargo inspections, supply subsidy to shipping industry and expand and upgrade maritime infrastructure, including shipping channels, ports, and supporting facilities. On August 14, 2015, President Jokowi delivered a state address at a joint plenary session of the People's Consultative Assembly, the House of Representatives, and the Regional Representative Council, "The government is committed to maritime development, and one of the most important projects is the maritime highway program with power stations. Land transport infrastructure is not limited to Java Island and large-scale construction will also be carried out in Sumatra, Papua, Kalimantan, Sulawesi, and other regions" [20].

The Jokowi administration established and promoted an "integrated" port system, consolidating big data on vessels entering and leaving ports to improve terminal management efficiency. Successive plans were

introduced for the construction of terminals, port logistics, and supporting facilities including communications, electricity, railways, and highways. Local governments in Sumatra, Sulawesi, Kalimantan, and Papua have been vigorously advancing railway construction, strengthening sea-land connectivity and facilitating the implementation of the maritime highway program. The construction of the sea toll road has already led to a 20%-30% decrease in the prices of productions in remote areas of Indonesia and was expecting to further lower overall logistics costs, thereby improving the business environment for trade and commerce [21].

Thirdly, vigorously support the development of port-side industries, especially the shipbuilding industry. The international shipping industry was a crucial pillar for Indonesia's construction of the "maritime highway" and the shipbuilding industry was a key maritime sector developed by the Jokowi administration. The Indonesian Ministry of Transportation has been actively developing the shipbuilding industry by raising special funds and building large-tonnage vessels as well as making the plan to achieve the construction of ships with a deadweight tonnage of 200,000 tons by 2020. The Indonesian government has not only eliminated import tariffs on ship components, provided more flexible bank guarantees, simplified procedures for shipbuilding enterprises to lease state-owned land, optimized ship designs, and spread Batam's shipbuilding experience, but also encouraged foreign enterprises coming to invest in the domestic shipbuilding industry and allowed foreign investors to establish wholly-owned ship management companies engaging in public international cargo businesses in the form of joint ventures or cooperative ventures. Foreign investors were permitted to build large vessels of 20,000 tons or more as wholly-owned enterprises in order to stimulate the recovery of Indonesia's shipbuilding industry. Under the intense promotion of the Jokowi administration, Indonesia's marine infrastructure construction—including ports and terminals—and the inter-island "sea toll roads" have been successively implemented. The initial phase involved building port-adjacent industrial parks and expanding five major hub ports in key islands such as North Sumatra, Jakarta, East Java, South Sulawesi, and Papua, aiming to improve logistics efficiency for vessels stuck at ports and reduce freight costs. In 2016, significant investments were made to complete traffic facilities centered on the Belawan Port. The 40-kilometer highway connecting Medan to Tebing Tinggi was completed, while the 16-kilometer highway linking Medan to Binjai opened to traffic by the end of 2017. Highways running along the northern coast of Java—specifically the Jakarta-Semarang, Semarang-Solo, and Solo-Surabaya sections—were scheduled to officially open by the end of 2018. Additionally, all facilities at the Bakauheni-Merak port were upgraded, consequentially, ferries were improved, and roads accessed to the port were constructed [22].

Fourthly, implementation to efficient policies and laws had ensured the attraction of foreigner investing and international cooperation in maritime infrastructure development. Indonesia has adopted three major measures. First and foremost, marine apartment has simplified the investment licensing and approval procedures; secondly, it has removed the obstacle of regulation for investors; and thirdly, Indonesia had consummated the relative laws and regulations and adjusted rules with relation to foreign enterprise investment as well as provided incentives for industrial investment. Indonesia's Ministry of National Development Planning compiled the Blue Book on the Use of Foreign Loans for 2015–2019 which allows foreign institutions to participate in 60 infrastructure projects, including terminals, bridges, and power stations through the BOT (Build-Operate-Transfer) model. The participation of foreign capital was introduced to compensate for the shortage of funds in maritime infrastructure construction. This plan described the Indonesian government would borrow US\$38 billion from foreign financial institutions over the next five years for maritime projects.

A new Public-Private Partnership (PPP) project plan was also promulgated by Joko administration, which further liberalized restrictions on port investment by raising the maximum foreign ownership stake from 49% to 95%, and explicitly defined that government have responsibility of guarantee during the concession period of PPP projects. In 2016, the Joko administration issued new foreign investment regulations to improve the

investment climate and create a favorable environment for foreign capital inflows. Under the new regulations, Indonesia not only allowed foreign investors to establish wholly foreign-owned enterprises (100% ownership) in the country, but also enhanced government efficiency and reduced the procedure of administrative approvals and operating expenditure for foreign enterprises. Central, provincial, and district governments in Indonesia had implemented a "one-stop investment service" to facilitate investors in obtaining investment licenses as soon as possible. Administrative approval time for foreign-invested enterprises has been reduced from the previous six months to a range of four hours to seven days [23].

Fifthly, the Jokowi administration had actively engaged in maritime diplomacy for strengthening regional cooperation between Indonesia and countries in the Asia-Pacific and the Indian Ocean regions. At the Indian Ocean Rim Association (IORA) Business Summit in March 2017, President Jokowi stated that Indonesia attaches great importance to IORA and emphasized that building Indonesia into a Global Maritime Fulcrum requires enhanced cooperation with the alliance [24]. Hence Indonesia was devoted to strengthening financial and technological cooperation in the field of marine infrastructure with extra-regional countries such as Russia, the United Kingdom, the Netherlands, and Belgium. On multiple international forums, President Jokowi has publicly expressed openness to European investors, who were committed to developing maritime infrastructure connectivity linking Indonesia with the Indian Ocean, the Mediterranean Sea, and the Persian Gulf. Indonesia's Global Maritime Fulcrum strategy leverages marine infrastructure development to not only create internationalized ports but also establish regional port-adjacent logistics centers and circulation service hubs to strengthen connectivity among islands and escalate Indonesia's role in the global marine economy as well as gradually realize the vision of becoming a maritime power.

4. The advancement of maritime infrastructure construction cooperation between Indonesia and China

Driven by the Belt and Road Initiative, Chinese enterprises have made substantial investments in Indonesia's maritime infrastructure construction, leveraging their strengths in capital, technology, equipment, and supporting services to facilitate the implementation and advancement of local maritime infrastructure projects in Indonesia.

4.1. Having established a framework for cooperation as early as the beginning of 21st century

In 2001, they signed the Memorandum of Understanding on Fisheries Cooperation, which covered jointly setting up factories, building and repairing ships and fishing ports construction. In 2002, they signed the Memorandum of Understanding on the Establishment of an Energy Forum, which provided a framework for bilateral energy cooperation, namely, both sides engaged in strategic cooperation regarding the joint exploration and exploitation of oil and gas resources, including the protection of energy transport route security and the construction of new energy transport corridors.

In 2005, China and Indonesia established a Strategic Partnership, launching cooperation and establishing negotiated and cooperative mechanisms for maritime issues [25]. In 2007 and 2011, respectively, the two sides signed two Memoranda of Understanding on Ocean Sector Cooperation between China and Indonesia, which declared that two countries were commonly committed to marine investment and jointly maintaining the security of sea lines of communication. In 2012, both parties further reached agreements including the Five-Year Plan for Maritime Cooperation between China and Indonesia (2013-2017) and the Memorandum of Understanding on Maritime Cooperation between China and Indonesia. China's upfront capital input and

successful ongoing marine infrastructure cooperation projects in Indonesia have laid a solid foundation for further expanding China-Indonesia marine infrastructure collaboration.

In 2013, China's leader Xi Jinping proposed the construction of the "Maritime Silk Road," which focus primarily on China's outbound investment to building ports, bridges, maritime transportation, and port industrial parks along the route. This aims to stimulate the economic development of inland areas in countries along the Belt and Road initiative and promote to bilateral and multilateral economic cooperation between China and these countries. In 2014, during the APEC CEO Summit, Joko Widodo provided a detailed introduction to Indonesia's national port development plan, expressing a warm welcome for Chinese enterprises to participate in port construction in Indonesia. In September 2016, Luhut, Indonesia's Minister of Maritime Affairs, was invited to Shanghai to attend a meeting about the investments of oceanic area hosted Chinese enterprises. The key topics of the conference included enhancing cooperation in offshore oil and gas, fish and seaweed plant, large port construction, and shipbuilding industries. Jokowi administration's Global Maritime Fulcrum strategy was highly compatible with China's "21st Century Maritime Silk Road" initiative, which resulted in Indonesia becoming a hotspot for Chinese investment, with the numerous enterprises from China continuously launched projects to build infrastructure in this country. This trend have reflected China's robust capital and technological advantages in marine infrastructure construction.

4.2. China-offered financing channels and platforms for China-Indonesia maritime infrastructure cooperation

Chinese enterprises primarily investing marine-related infrastructure, including ports, port power facilities, machinery, bridges, railways, and expressways in Indonesia. The Indonesian government actively welcomed Chinese enterprises engaging in its marine construction programme. So major state-owned enterprises, such as China Harbour Engineering Company (CHEC), China Communications Construction Company (CCCC), and China Road and Bridge Corporation (CRBC), successively undertook large-scale marine infrastructure projects under bilateral cooperation. The Chinese government, enterprises, and financial institutions provided multiple financing channels and platforms for cooperation in maritime infrastructure construction between China and Indonesia. In terms of port construction, Tanjung Priok Port began its privatization process in 1999. Hutchison Whampoa increased its direct investment in the port's container terminals, becoming the largest operator of international container terminals in Jakarta. CHEC won the bid for the expansion project of the Hutchison Jakarta International Container Terminal [26]. China and Indonesia signed agreements to cooperate on the construction of Tanjung Priok Port and the Soekarno-Hatta Port in Madura. CHEC subsequently undertook a series of dredging projects, container terminal constructions, marine engineering projects, and large-scale power station projects supporting the terminals, with a total contract value approaching US\$500 million [27].

The Chinese government has established the Asian Infrastructure Investment Bank (AIIB) and Silk Road Fund, respectively supplying \$10 billion and \$40 billion for China-ASEAN infrastructure special loan. Simultaneously, Chinese government had planned to invest \$50 billion as construction fund investing in Indonesia, covering railways, power plants, and roads along the ports. So it also encouraged the large number of Chinese companies to employ in Indonesia's construction projects supported by the AIIB and the Silk Road Fund [28]. In April 2015, meeting with President Joko Widodo, President Xi Jinping announced to supply funds for building Indonesian ports and communication devices in islands. China was willing to participate in building the interconnected infrastructure of railways, roads, ports, docks, dams, airports, and bridges in Indonesia, and to provide financial support for related projects in various ways [29]. China has committed to investing \$68.1 billion in cooperative projects in Indonesia, with an additional 2.1 billion yuan (approximately

\$340 million) added to the cooperation projects, resulting in a total of \$68.44 billion in contract projects during Joko Widodo's visit to China [30]. The China Development Bank provided a \$6 billion loan for power plant projects on Java Island. China Communications Construction Company has finalized a \$2.5 billion agreement to upgrade 30 ports in Eastern Indonesia. As of the end of March 2015, the investment amount agreed upon between China and Indonesia for infrastructure reached \$63.4 billion [31]. The Indonesian government tended to eliminate discrimination and barriers for encouraging enterprises, banks, and other financial institutions to join the AIIB, in order to secure fund for constructing facilities such as ports and maritime highways.

4.3. Well-funded large-scale Chinese state-owned enterprises: major drivers responding to the Belt and Road initiative

Chinese enterprises not only possess maturity techniques and advance equipment, but also have efficient capabilities of the large-scale infrastructure construction and cost advantages in marine infrastructure project. Typically, major Chinese state-owned enterprises establish new investment companies through joint ventures with Indonesian state-controlled enterprises to advance the delivery of maritime infrastructure projects. Large-scale China-Indonesia maritime infrastructure cooperation projects involve investments worth hundreds of millions of US dollars, and most are implemented under the BOT model. A consortium of Chinese enterprises led by China Railway Corporation formally signed an agreement to set up a China-Indonesia joint venture with an Indonesian state-owned enterprise consortium headed by Wijaya Karya (WIKA). The joint venture is tasked with constructing the Jakarta-Bandung High-Speed Rail project in Indonesia.

A business consortium consisting of COSCO Shipping Group and China Merchants Group participated in the tender for the expansion of Tanjung Priok Port, seizing opportunities to engage in China-Indonesia cooperation in maritime affairs, port development and energy sectors [32]. In terms of maritime transport infrastructure, China Communications Construction Company (CCCC) built the bridge connecting Surabaya, Indonesia's second-largest city, and Madura Island, which has become the largest cross-sea bridge in Indonesia and even Southeast Asia. China and Indonesia signed a Memorandum of Understanding to jointly develop eastern seaports including Bitung and Sulang in North Sulawesi Province. The agreement also covers a highway from Bitung Port to Manado, the capital of North Sulawesi Province, to be constructed by Chinese contractors [33]. China Communications Construction Company secured a cooperation agreement worth USD 2.5 billion to upgrade 30 ports in eastern Indonesia. COSCO, China Shipping and China Merchants Group have expressed interest in the expansion project of Tanjung Priok Port [34].

4.4. Having expanded many fields with relative to marine industry

They have including the construction of deep-water berths, development of port-side industrial parks, port power supply, inter-island transport connectivity and port expansion has expanded to the development of stable water and electricity facilities such as photovoltaic and thermal power plants for marine fisheries, port industrial parks and terminals, as well as transport terminals for the development and export of inland mining industries and infrastructure construction in core cities. Such efforts boost the integration of Indonesia's land and marine industries with infrastructure development in port cities, stimulate economic spillover between coastal areas and inland hinterlands, and enhance inter-island connectivity and logistics in Indonesia. For instance, the Batang Hydropower Plant, Indonesia's largest hydropower project under construction, is jointly invested by PowerChina and Perusahaan Listrik Negara (PLN) of Indonesia with a total investment of USD 1.42 billion. Apart from the main dam, supporting facilities including inter-basin water conveyance and navigation structures will be built to guarantee stable power supply for port-side industrial parks on Sulawesi

Island [35]. Huawei's 5G technology builds a comprehensive digital foundation to support the digital upgrading of ports and port industrial parks and improve the production efficiency of offshore fisheries.

Chinese enterprises boast mature technologies and equipment, efficient construction capacity and cost advantages in maritime infrastructure cooperation in Indonesia. They have smoothly delivered a series of projects such as the Suramadu Bridge and Jatiluhur Dam. In addition, major investment and contracted projects undertaken by Chinese enterprises in Indonesia include transportation infrastructure works namely the Serang-Panimbang Toll Road, Semarang-Demak Toll Road and Suramadu Bridge; a large number of power plant projects in Meulaboh, Pangkalan Susu, Balikpapan, Java 7, South Sumatra 1 and South Sumatra 8; as well as the China-Indonesia "Two Countries, One Park", China-Indonesia Economic and Trade Cooperation Zone, Tsingshan Industrial Park and Delong Industrial Park. The construction of the China-invested Jakarta-Bandung High-Speed Rail in Indonesia officially commenced on January 21, 2016. In recent years, Indonesia has consistently been China's largest engineering contracting market in Southeast Asia and a key destination for China's overseas maritime infrastructure projects.

4.5. Attach importance to the transfer of marine technology and the cultivation of marine technology talents

The Indonesian government and enterprises hope to achieve the transfer of China's advanced technology and the cultivation of Indonesian marine technology talents in marine infrastructure cooperation. To reduce risks, Chinese enterprises investing in Indonesia cultivate local technical and management talents to participate in enterprise operations, or contract engineering projects to local operators, showing a trend of localization in enterprise management. For example, more than half of the middle-level and above management personnel of China Harbor Indonesia are local Indonesians. The company provides technical training for local Indonesian employees and offers internship and employment opportunities for Indonesian university students. According to incomplete statistics, China Harbor Indonesia has provided more than 20,000 jobs for the local community and donated a total of 1 billion Indonesian rupiah in scholarships since 2010. The State Oceanic Administration has provided postgraduate degrees and technical training for 150 young Indonesian students and scientists through the Chinese Government Oceanic Scholarship and various non-degree training institutions [36]. In 2015, China Minsheng Investment Corporation also established a "the Belt and Road" talent cultivation fund, which will invest a total of 100 million yuan over 10 years to cultivate technical talents in Indonesia. In January 2021, Huawei launched the Huawei ASEAN Academy project and cooperated with 33 top universities in Indonesia, benefiting 12,000 technical personnel and 7,000 university students. Huawei plans to continue providing training for 100,000 local technicians, students, civil servants and other groups in Indonesia through Information and Communications Technology (ICT) programmes over the next five years [37].

5. Motivations for China-Indonesia cooperation in marine infrastructure development

Geostrategically, Indonesia straddles the Pacific and Indian Oceans, through which half of the world's container shipping and two-thirds of global seaborne energy transport pass. To guarantee the unimpeded and secure operation of its maritime lifelines, China's deepened marine infrastructure cooperation with Indonesia carries important economic and strategic significance.

First, the joint impetus brought by the national strategic planning of China and Indonesia. China's Belt and Road Initiative aligns with President Joko Widodo's strategy of building a maritime power. With support from

China, Indonesia seeks to advance the construction of its Sea Toll Road, develop marine industries, become a maritime power and restore its status as a major maritime nation. As an important pivot and foothold for advancing China's Belt and Road Initiative, Indonesia occupies a prominent strategic position in the construction of the Silk Road in Southeast Asia, which facilitates the development and expansion of bilateral cooperation on marine infrastructure development. Konis Ruhurima, an analyst at Indonesia's Social Research Institute, pointed out that Indonesia's Sea Toll Road initiative can be part of China's 21st-Century Maritime Silk Road. Enhanced east-west connectivity within Indonesia will further boost the growth of its maritime economy. The rising economic strength of China guarantees the advancement of the Maritime Silk Road strategy, and Indonesia's Sea Toll Road initiative undoubtedly supports China's strategy [38]. In October 2013, President Xi Jinping of China delivered a speech at the Indonesian Parliament upon invitation and put forward the initiative to jointly build the 21st-Century Maritime Silk Road. At the East Asia Summit in 2014, Indonesian President Joko Widodo proposed the vision of Global Maritime Fulcrum to build Indonesia into a maritime power, emphasizing that China-Indonesia maritime cooperation should prioritize maritime and infrastructure development to drive overall bilateral cooperation [39]. At the end of 2014, Chinese Foreign Minister Wang Yi held talks with Indonesian Foreign Minister Retno Marsudi. "China's 21st-Century Maritime Silk Road and Indonesia's Global Maritime Fulcrum strategy complement each other. We hope to witness more cooperation between the two sides, especially in infrastructure construction" [40]. At the 12th China-ASEAN Expo, Nus, Director-General for Export Development of Indonesia's Ministry of Trade, stated that Indonesia's infrastructure remains relatively underdeveloped, with strong demand for highways, high-speed railways, ports and other facilities. He expressed hope to strengthen cooperation with Chinese enterprises [41].

Secondly, China and Indonesia exhibit complementary advantages in labor resources, capital endowment, and marine infrastructure construction technology. With the gradual disappearance of China's demographic dividend and the continuous rise in domestic corporate operating costs, Chinese enterprises are motivated to conduct outbound investments to access overseas low-cost labor and abundant natural resources. As the world's fourth-most populous country with 255 million residents, Indonesia features inexpensive labor. Its current national average minimum wage is 2 million rupiah (148 US dollars), which is considerably lower than that of Malaysia, Thailand, and the Philippines [42]. In contrast, China possesses absolute superiorities in capital reserve and core technologies, boasting world-class capabilities in wharf construction, modern port container shipping, port power and network supporting facilities, as well as port-adjacent expressways and high-speed railways. Although Indonesia sustains steady economic growth, its growth momentum is constrained by insufficient investment in fundamental infrastructure. The Indonesian government projected that its total infrastructure investment demand would reach 932.7 billion US dollars during 2011–2030, among which 80% to 90% relies on foreign capital injection [43]. According to Indonesia's 2015–2019 Mid-Term National Development Plan, the country planned to construct 2,650 kilometers of highways, 1,000 kilometers of expressways, 3,258 kilometers of railways, 24 large ports, 60 ferry terminals, 15 modern airports, 14 industrial parks, 49 reservoirs, and 33 hydropower stations, requiring an estimated investment of 424.5 billion US dollars. Restricted by limited fiscal revenue, the Indonesian government needs to raise at least 25 billion US dollars, or potentially up to 40 billion US dollars, through foreign borrowing [44]. The large-scale development of marine infrastructure in Indonesia provides favorable opportunities and essential preconditions for Chinese enterprises to leverage their capital and technological strengths to undertake marine infrastructure projects, provide financial services, expand overseas markets, and further deepen Sino-Indonesian bilateral cooperation.

Thirdly, China-Indonesia maritime infrastructure cooperation serves the need to boost bilateral trade and investment growth so as to achieve win-win economic outcomes. The construction of maritime infrastructure

projects directly drives the development of supporting industries in Indonesia including smelting, manufacturing, power, electronics, services and logistics, as well as the growth of Indonesia's port economy. It also facilitates the global expansion of Chinese enterprises and the export of relevant machinery, equipment, technologies and commodities, thereby elevating economic cooperation between China and Indonesia. In recent years, the expansion of China-Indonesia maritime infrastructure cooperation has brought about a sharp surge in bilateral logistics, trade and investment. Forty percent of goods handled at Tanjung Priok Port are Chinese products. Thanks to the participation of Chinese enterprises in port management, Tanjung Priok Port has achieved remarkable progress in infrastructure development, with visible improvements within just two years. In terms of operational efficiency, vessel berthing time has been cut from the original 2–2.5 hours to only 1.5 hours [45]. There remains enormous room for China-Indonesia cooperation in maritime infrastructure. China's capital and advanced technologies are channelled into Indonesia's modern railways, bridges, power facilities and other projects related to seaports and maritime transport, contributing to the growth of bilateral trade and investment. Every month, Chinese vessels account for 20% to 30% of all foreign ships calling at Tanjung Priok Port, making the port a key hub for trade exchanges between the two countries. Statistics from China's Ministry of Commerce show that in 2015, the value of newly signed engineering contracts between the two countries reached USD 5.2 billion, with completed turnover hitting USD 4.6 billion. China's investment in Indonesia exceeded USD 1 billion, ranking second among ASEAN member states (only behind Singapore) and registering a year-on-year increase of 38% [46]. In the first half of 2016, direct investment from the Chinese mainland in Indonesia surged by 532% year-on-year, lifting China from Indonesia's tenth-largest source of foreign investment to the third (excluding Hong Kong, Macao and Taiwan regions). Chinese enterprises have actively invested in regions such as Sulawesi and Jayapura in Papua, successively building smelters for nickel and bauxite, cement plants, modern industrial zones and residential areas, effectively supporting the Indonesian government's goal of balanced development [47]. China-Indonesia maritime infrastructure cooperation has effectively advanced the upgrading of Indonesia's maritime infrastructure, modernised local port administration, created more local jobs, helped alleviate poverty in Indonesia, and narrowed the economic development gap between the country's eastern and western regions.

Lastly, there is a practical need to advance connectivity and regional economic cooperation between China and ASEAN. The Master Plan on ASEAN-China Connectivity covers physical infrastructure projects, consisting of two systems: first, a land transport system formed by highway and railway networks on islands and peninsulas; second, a maritime transport system made up of shipping routes [48]. With sustained economic growth in China, shifting geo-economic relations have strengthened ties between ASEAN countries and China, and achieving connectivity between China and the ASEAN region has become a consensus among ASEAN member states. From a geo-economic perspective, China is to a large extent a major driving force and geo-hub for global land connectivity. Supporting Indonesia's maritime infrastructure development enables Indonesia to serve as a hub for land and sea connectivity between China and ASEAN, allowing both China and Indonesia to integrate more closely into the Asia-Pacific economic circle, the Eurasian economic zone and even the Indo-Pacific economic circle. The two-ocean strategy (covering the Pacific and Indian Oceans) embodied in China's 21st-Century Maritime Silk Road Initiative and Indonesia's Global Maritime Fulcrum strategy provides an experiential model for China to explore cooperation with countries across the Indian Ocean and Pacific regions. Building on China-Indonesia maritime infrastructure cooperation, China can expand Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) engagement with the Indian Ocean rim. From a security strategy perspective, participating in Indonesia's maritime infrastructure development constitutes an important pivot for China to further expand its maritime reach and deepen overseas maritime economic cooperation. Constructing seaports in Indonesia helps

guarantee the unimpeded and secure passage of China's maritime lifelines, safeguard China's maritime rights and interests in the South China Sea, and support China's pursuit of great power status. China's port investments and establishment of port industrial parks on Sumatra and Kalimantan islands equip these ports with the capacity to supply Chinese vessels on long-distance voyages. These facilities function as China's strategic pivots in Southeast Asia, fostering a favourable external environment for China's development [49].

6. Risks and challenges of China-Indonesia maritime infrastructure cooperation

As China-Indonesia cooperation in maritime infrastructure development moves forward, Chinese investment and collaborative projects in Indonesia are confronted with new challenges and certain uncertainties.

First, Indonesia's central-local decentralized governance structure and the rivalry of pluralistic political forces significantly increase the operational costs and investment risks for Chinese enterprises. The country consists of 34 first-level administrative regions, including 29 provinces, four special administrative zones, and the capital district. Political decentralization empowers local governments with substantial discretionary power, resulting in inconsistent and even conflicting legal frameworks, tax policies, and administrative standards across regions, as well as insufficient public service supply [50]. As a multi-party democracy, Indonesia features fragmented political interests and divergent policy orientations among different political factions. The Joko Widodo administration is constrained by domestic power checks and balances, which greatly limits the implementation efficiency of its national maritime strategy and marine infrastructure development plans. Among the 13 central government authorities involved in maritime governance, only four subordinate agencies under the Ministry of Maritime Affairs and Investment have actively promoted relevant policies, whereas most other departments remain passive and uncoordinated. Coupled with low administrative efficiency at the provincial level, inter-departmental fragmentation and local bureaucratic inertia severely delay project progress, further elevating the institutional risks of Chinese investment projects. Furthermore, Chinese-led marine infrastructure projects in Indonesia must navigate complicated interpersonal relations and intricate political realities.

During the B. J. Habibie administration, provincial governments were granted substantial administrative authority and autonomy over natural-resource governance and utilization, including powers for investment project approval and land-use planning. The central government maintains limited leverage over regional jurisdictions. Centrally initiated projects hinge on local governmental cooperation, whereby local authorities exert decisive influence over Sino-Indonesian cooperative schemes, while the central government acts merely as an external intervening actor. Without tangible material benefits and returns, projects that deliver no short-term visible outcomes offer little political capital for local officials seeking re-election. This scenario results in low local willingness to cooperate, and even implicit obstruction. Intertwined interests among local political factions, military actors, landowners, business elites and rural farmers create complex overlapping constraints that generate varying degrees of obstacles for the smooth delivery of bilateral marine-infrastructure initiatives. The China-Indonesia High-Speed Railway Joint Venture encountered numerous hurdles. Land disputes and compensation issues substantially slowed down project advancement. Furthermore, systemic political corruption prevails in Indonesia, where officials wield considerable discretionary power. Enterprises, organizations and individuals are often compelled to pay unofficial gratuities to facilitate administrative procedures. Although Joko Widodo has demonstrated strong ambitions for anti-corruption campaigns, deeply entrenched corrupt practices in Indonesian society cannot be fundamentally eradicated. Consequently, the

interpersonal and social costs borne by Chinese enterprises constitute a non-negligible component of project operations.

Second, the discourse of "China's economic threat" and narrow nationalist sentiment within Indonesia foster strong vigilance against Chinese-led marine infrastructure construction. Fueled by Western narratives, "China threat" rhetoric persists in parts of Indonesia's mainstream society. Extremist religious-nationalist groups remain wary of foreign investment introduced for the "Maritime Highway" initiative. They adopt uncompromising stances on economic interests, deliberately erect multiple barriers, and even denounce relevant cooperation as an act of national betrayal. For instance, Sultan Hamengkubuwono, Governor of the Special Region of Yogyakarta, publicly stated that Indonesia should reject China's Maritime Silk Road. If Indonesia cooperates with China under the Maritime Silk Road framework, it will merely become a consumer of Chinese goods [51]. Some Indonesian scholars hold pervasive negative and confrontational perceptions regarding China's initiatives. They interpret such initiatives as China's pursuit of hegemony in the South China Sea, reflecting an ambition to control trade routes through maritime and port facilities across Indonesia's southern regions [52]. Arif, Deputy Minister of the Ministry of Maritime Affairs and Investment, advised President Joko Widodo that Indonesia should avoid over-reliance on China for port and other infrastructure development, and keep Sino-Indonesian cooperation at a moderate level. He argued that China's construction of bases and ports across Asia-Pacific countries represents an attempt to exercise long-term control over sea lanes in the South China Sea and the Indian Ocean [53]. These Indonesian scholars contend that nationally strategic ports such as Tanjung Priok and Bitung have become nodes within China's logistics network (the Belt and Road port chain), notwithstanding formal ownership by Indonesia's state-owned port authority. This trend, in their view, poses severe risks to Indonesia's economic and political sovereignty, as it may create technological and logistics-data dependency. Almost all Chinese-funded port projects are connected to Chinese cloud-based port management systems. They warn that China could potentially leverage these logistics corridors to provide support for merchant shipping or conduct military exercises, raising concerns over de-facto naval basing. Furthermore, the ports of Gorontalo and Bitung carry substantial geopolitical weight within the Asia-Pacific global order. Such developments are believed to jeopardize Indonesia's sovereign status as an independent state. According to these scholars, the incumbent government should reinstate Indonesia's non-aligned stance, uphold an independent foreign policy, and refrain from becoming a "pawn" of any particular major power [54].

Third, China faces fierce international competition from Japan, the United States, Singapore, the European Union and other actors over bidding rights for Indonesian port construction and Maritime Highway projects. Leveraging its geopolitical advantages, Indonesia has deepened cooperation with Japan, the United States, the European Union, neighbouring Singapore, India and other countries to balance China's economic influence within its territory. As early as the 1970s and 1980s, the Japanese government penetrated the Indonesian market through loans and economic aid. Japanese goods, technologies and after-sales services enjoy a solid reputation in Indonesia, and Japanese enterprises attach great importance to building a positive public image and delivering grant-assisted projects for Indonesia. In August 2014, President Joko Widodo visited Japan, with a key objective of securing Japanese investment and economic aid for Indonesia's marine infrastructure [55].

In 2015, China and Japan engaged in protracted rivalry over the Jakarta-Bandung High-Speed Rail project. Japan offered the Indonesian government a full-coverage loan of approximately 60 trillion rupiah with an interest rate below 0.5%, alongside low-cost technology transfer. It also put forward three "assistance programmes": (1) Japan would assist Indonesia in ship maintenance, particularly for vessels operating in eastern Indonesia and Papua; (2) Japan was ready to cooperate with Indonesia to strengthen maritime security

capacity, covering waters such as the Strait of Malacca; (3) Japan and Indonesia would scale up cooperation in marine-related development. In 2015, Indonesia's Coordinating Minister for Maritime Affairs visited Japan and signed an agreement with then-Foreign Minister Fumio Kishida. Under this deal, Japan provided USD 700 million in aid for Indonesian port construction, outlying-island development, and capacity-building for maritime law-enforcement agencies [56]. The two governments also established the Japan-Indonesia Maritime Forum as a bilateral consultation mechanism for maritime cooperation. Mitsubishi Corporation of Japan became the contractor for the Tanjung Priok port expansion project.

In addition, Indonesia has reached cooperative arrangements with the United States covering maritime defence, marine economy, marine data management, shipping-lane safety and marine technology. In May 2015, the United States channelled USD 11 billion in infrastructure loans to Indonesia through the World Bank. In October the same year, the United States and Indonesia held talks to deepen their Comprehensive Partnership and expand bilateral maritime cooperation. The United States sought to draw Indonesia closer to compete with China in maritime domains across the Asia-Pacific, aiming to contain China's maritime power.

The Government of Singapore has demonstrated strong interest in investing in the neighbouring Batam, Bintan and Karimun regions. The Indonesian government, in turn, promoted joint port-building projects with Singapore on the Nias Islands, Tolok Island and Nipah Island, and granted permission for Singaporean vessels to berth at these newly constructed harbours. For EU countries, marine-infrastructure investment offers high returns and serves as an effective approach to gaining market access in Indonesia. EU member states have invested in the development of Kuala Tanjung Port on Sumatra Island [57]. Indonesia has also negotiated connectivity and infrastructure-building cooperation with Russia, discussed shipbuilding and port collaboration with the Netherlands, and sought shipbuilding-technology support from Belgium.

In summary, Indonesia pursues diversified partnerships for its marine infrastructure development. On the one hand, it harnesses foreign capital and technology to advance its national maritime-power strategy. On the other hand, it maintains a balance among economic partners so as to avoid over-reliance on any single major economy and safeguard its economic sovereignty and autonomy. Meanwhile, Indonesia capitalises on great-power competition to obtain favourable loans and economic assistance, thereby maximising its interests through multi-lateral cooperation.

Fourth, the South China Sea dispute raises investment risks for China-Indonesia maritime infrastructure cooperation projects. The core point of contention between Indonesia and China does not lie in the sovereignty of the Natuna Islands. China has stated on multiple occasions that it recognizes Indonesian sovereignty over the Natuna Islands. Nevertheless, Indonesia unilaterally declared an Exclusive Economic Zone (EEZ) that covers 50,000 square kilometres of China's traditional maritime boundary waters [58]. A prevailing view within Indonesia holds that China has not clarified its claims concerning the exclusive economic zone adjacent to the Natuna Islands, which poses a tangible threat to Indonesia. Accordingly, Indonesia argues that it should prepare in advance for adverse actions by all parties to the dispute [59]. At present, Indonesia handles the bilateral EEZ disputes in the South China Sea with a low-key approach and maintains a degree of tacit understanding. It claims to remain neutral on South China Sea issues and actively acts as a mediator.

Even so, Indonesia keeps constant vigilance over China's strategic posturing in the South China Sea. In October 2014, the Commander-in-Chief of the Indonesian Armed Forces stated in a speech during his visit to Singapore that China's growing military strength will affect stability in Southeast Asia [60]. Indonesian armed vessels have harassed Chinese fishing boats operating in waters near the Natuna Islands and detained Chinese fishermen. Joko Widodo issued an instruction that "illegal" fishing vessels in South China Sea waters should be sunk directly instead of being arrested. Since October 2014, nearly one hundred foreign fishing vessels, including Chinese-flagged ones, have been sunk by Indonesia, inflicting substantial economic losses on

Chinese fishermen. From the launch of Indonesia's crackdown on illegal fishing to March 2015, Chinese economic losses exceeded 130 million US dollars, with potential future losses reaching as high as 500 million US dollars, reducing China's marine fishery catch by 24 % to 34 % [61].

Indonesia has strengthened its maritime security policies by deploying armed forces in the South China Sea and actively participating in US-led multilateral and bilateral defence ties to build extensive military cooperation. In 2013, the United States sold eight Apache attack helicopters to Indonesia and agreed to conduct joint military exercises with the country. On 1 April, Indonesia's Minister of Defence described the Natuna Islands as a gateway and announced that Indonesia would deploy F-16 fighter jets there [62]. The possibility that Indonesia may adopt more hard-line measures over the South China Sea cannot be ruled out. Coercive law-enforcement actions by Indonesia's maritime law-enforcement agencies are bound to strain bilateral relations and introduce volatile political factors for Chinese enterprises investing in Indonesian maritime infrastructure.

Fifth, non-traditional security challenges including terrorism, rampant piracy and transnational maritime crimes persist in Indonesia's offshore waters. As the world's largest Muslim-majority country, Indonesia faces maritime infiltration by international religious extremist forces. These forces have expanded their influence within mainstream Indonesian society, penetrated local communities, and spread extremist ideologies through grassroots organizations, posing grave threats to Indonesia's domestic social stability and security. This creates latent security risks for the long-term China-Indonesia maritime infrastructure cooperation. Furthermore, maritime infrastructure projects are characterised by long construction cycles, large capital requirements, and high political sensitivity. They are vulnerable to disturbances from political and natural environments. Quite a number of Chinese-invested projects have ended up unfinished or remained contractual commitments without actual implementation. China's implementation rate of investment commitments in Indonesia is lower than that of Japan. According to statistics, China's investment implementation ratio in Indonesia stands at 1:10, compared with Japan's 1:6.5. This means that only one out of ten promised Chinese-funded investment projects is delivered, while Japan achieves one implemented project out of every 6.5 pledged projects [52]. Fierce cut-throat competition also exists among Chinese enterprises operating in Indonesia, further exacerbating overseas investment risks. After early-entering Chinese investors reaped substantial returns, a flood of domestic Chinese firms rushed into the Indonesian market. To secure access to investment opportunities in Indonesia's maritime sector, Chinese enterprises frequently engage in price wars during project bidding.

7. Conclusion

Favorable diplomatic ties between China and Indonesia and strategic consensus between the leaders of the two countries constitute an effective driving force for bilateral maritime infrastructure cooperation. As a country along the Belt and Road Initiative, Indonesia boasts a vast market indispensable for advancing China's 21st-Century Maritime Silk Road. Meanwhile, Indonesia's development strategy of building itself into a Global Maritime Fulcrum calls for China's participation, and the two sides feature strong complementarity in resources. China-Indonesia cooperation on maritime infrastructure has achieved tangible outcomes. The successive completion of maritime infrastructure projects in Indonesia has greatly relieved pressure on ports, shipping, land and sea transport, accelerated the flow of logistics, goods and people within and across Indonesian islands, and strengthened connectivity between China and Indonesia as well as between China and ASEAN.

Nevertheless, it cannot be ignored that Chinese enterprises encounter numerous challenges when constructing maritime infrastructure in Indonesia, including frequent adjustments to laws and policies, difficulties in land acquisition, and cut-throat competition among peers. They are also plagued by uncertainties such as territorial disputes and maritime non-traditional security risks. China and Indonesia need to properly manage differences over the South China Sea, carry out diversified people-to-people exchanges, and improve multi-level and all-dimensional dialogue and consultation mechanisms. Both sides should conduct exchanges covering maritime security, counter-terrorism, maritime cultural exchanges and marine environmental protection, and strive to foster a sound environment for the sound development of bilateral maritime infrastructure cooperation.

The two sides should strengthen coordination and jointly explore overseas markets to avoid vicious competition and asset losses. It is vital to effectively anticipate and manage potential risks, draw up contingency plans in advance, cultivate a positive overseas image, and reconcile the pursuit of corporate profit maximization with national political and economic interests. Attention should also be paid to safeguarding the interests of local communities and protecting the local natural ecological environment. Efforts are needed to resolve misunderstandings and even hostility among local mainstream society toward the Chinese government and Chinese enterprises, and reduce external obstacles to project construction. These measures will enable more China-Indonesia maritime infrastructure cooperation projects to be effectively implemented, bringing benefits to both countries and local populations.

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