

## **CHAPTER III**

### **CHINA'S RAILWAY DEVELOPMENT AND CHINA'S RAILWAY PROJECTS IN SOUTHEAST ASIA**

This chapter will explain about the historical development of China's railway which recently gained world's attention. Its fast development from only absorbing technology to develop its own high-speed rail has made China gained confidence to send its technology overseas. Railway then used by China to help the expansion of its economic influence. Southeast Asia, which has high demand on infrastructure, then becomes China's target to send its railway technology. This chapter will also explain about the efforts of China in railway projects when entering Southeast Asia.

#### **A. China's Railway Development**

The development of transport in domestic has increase significantly as the impact of China's growing economy. Before, the inland water transport were functioned mainly, however, rail was still carried the most cargo traffic in the country. Although the development of rail in the first place was going slow, railway could provide a medium and long distance travel for passenger transports, compared to highways which mainly used by the passenger to travel. Since the modern rolling stock and equipment has been developed for railway, it has been became a sophisticated transport and an important infrastructure for domestic China (Parkash, 2008).

## **1. History of China's Railway**

Having the largest population in the world with vast territory and uneven distribution of resource has made China's economic more challenging. Railway technology, therefore, become the important national infrastructure that hopes can provide China's overall transportation system and give greater advantages for domestic economy. The railway construction in China has begun decades ago in the era of Qing Dynasty and now China has become the country with large rail network spreading nationally (Chinasage, 2016).

In the first entry of railway technology in China, British became the carriage and builder of railway system which took place in Shanghai. It happened in 1876 on the banks of Yangzi River and only 24 kilometers-long. The first railway system received much protest and opposition from local that railways could bring bad Feng Shui, as well as the fear of the unemployment and financial ruin as railway could replace the porters and wheelbarrows. However, China's ambassador for the United Kingdom expressed his interest towards the railway (Chinasage, 2016).

In 1880s, the 80 kilometers-long railway was built on route from Tianjin to Hebei, becoming the first stage of China's railway. Just then, the Qing government has seen railway as a threat. The railway considered too dangerous as its allowed foreign troops and missionaries spreading their influence deep into China. However, the bad financial situation in that time has made the Qing government permitted the railway technology from Britain, Russia, Japan, and

Germany and let them build railway systems all over China. This also marked that the construction of railway in China began to have a plan (Chinasage, 2016).

Since 1928, the ruling party of Guomindang once set up the Ministry of Railways which became a unified management of the national railway undertakings. Under the Guomindang government, in the period of 1928 up until 1948, there was a total of 13,000 kilometers of railway constructions in China's mainland(Chinasage, 2016).

After the founding of People's Republic of China October 1, 1949, a total of 8.278 kilometers of broken and inadequate railway has been restored. The damage mainly caused by the twenty years of Sino-Japanese War. In this period, many provinces had no railway at all due to the populations and geographical conditions. The first Five Year Plan by Mao then aimed to build links for military purposes. The Third Plenary Session of the Communist Party of China has made the state gradually restore railway work development. However, the new period of China's railway development happened in the year of 1979. The implementation of opening up policy, along with the new period of economy, stated that railway transport has become an important reason for economic development. The period was given a path to China reaching the modern era of railways(Chinasage, 2016).

From 2004, China has reflected its alteration from initial student to become completely independent intellectual property rights of high-speed railway. The introduction of technology and absorption of innovation had become the Chinese enterprises' important capital of high-speed rail technology to participate in international competition. On April, 2004, the Central Committee and State

Council leaders organized a special meeting to study the development of railway construction to lead China into the modernization of railway technology. The meeting issued the research of rolling stock and equipment, established the modernization of railway technology and equipment, introduce the advanced technology, joint design and production in order to build the Chinese brand(Li L. , 2010).

The world's mastery of high-speed Electric Multiple Unit (EMU) design and manufacturing technology companies are Germany's Siemens, France Alstom, Japan Kawasaki Heavy Industries, Canada Bombardier, and several other were initially want to use the joint venture to play a role along the high-speed field in China. However, it was clearly rejected by Railway Department(Li L. , 2010).

At that time, China adhered to the outside of the Chinese enterprises to transfer technology, thus the domestic enterprises were able to master their own core technology. In this round of bidding, Alstom won a large single EUR 620 million and the North car group under the long passenger shares (Changchun Railway Bus Co., Ltd.) joint, for China to provide and cooperate to build 60 electric car group. Canada Bombardier, Japan Kawasaki Heavy Industries, France Alstom, and Germany Siemens introduced the technology, joint design, and production of high-speed EMU. Thus, the absorption of four international advanced technologies has become the foundation for China's high-speed rail independent research and development(Li L. , 2010).

## **2. Entering the Era of High-speed Rail**

Shuguang (2007) said that the railway development has been become a crucial things for Chinese economic development. The Ministry of Railways has seen the railway transport capacity as a social development that with its shortage it was not suited to the fast economic development. In this regard, the CPC Central Committee and State Council attached great importance to speed up the development of railway construction, made a request to the railway sector, seeking to solve this problem.

In April 2007, China Railway officially entered the era of high-speed railway. There were EMU of China's own production that become China Express Railway Passenger with train of 200 kilometers speed. There was also nearly 1000 kilometers line provided to the train with the speed reached 250 kilometers.

China has chosen the most inevitable choice for achieving modernization of China's railway technology and equipment. The opportunity that given by economic globalization has let China to absorb and learn from the world's advanced technology and civilized achievement. The great market advantage of China made the digestion and absorption took shorter time and smaller cost(Shuguang, 2007). China's high-speed rail manufacture was digesting and absorbing another four countries technology which is Canada Bombardier, Japan Kawasaki Heavy Industries, France Alstom, and Germany Siemens. Chinese enterprises have successfully mastered the high-speed EMU assembly: body, bogie, traction, train network and braking system, pantograph, air conditioning system, and other nine key technologies of railway. All of them were

manufactured with independent intellectual property rights of the EMU product line. A total of four models of Chinese EMU were in operations; CRH1, CRH2, CRH3, and CRH5, where the CRH is the abbreviation of China Railway High-speed.

The CRH1 train was manufactured by a Sino-foreign joint venture Qingdao Quartet - Bombardier - Bauer (BSP) Company, the company's main technology investor is Canada's Bombardier. The CRH2 train, which the prototype of the Japanese Shinkansen E2-1000, manufactured by China South Locomotive Group (owned by Qingdao Quartet Locomotive & Rolling Stock Co., Ltd. and Japan Kawasaki) with the speed reached 200-300 km/h. The CRH3 train was 300 km/h high-speed trains which was the prototype of German ICE3, manufactured by the Tangshan locomotive factory and the German Siemens. The CRH5 train was the prototype of France Alstom for Finland to provide SM3 type, manufactured by the Chinese manufacturers for the Changchun bus factory.

After projects above, in December 2007, China had been completing the assembly line of China's first 300 km/h EMU trains Beijing-Tianjin intercity railway operations. There was also the Beijing-Shanghai high-speed railway with the largest investment and having the highest technological content of project becoming China's first high-speed railway with the world's advanced level. This railway had 1318 kilometers-long with the highest speed of 350 km/h making it possible to take route from Beijing to Shanghai with only 5 hours with more than 8000 passenger. This also marked China to become the world's fourth

independent development of 300 km/h high-speed rail technology power after French, Germany, and Japan(Xiaowen, 2008).

### **3. China's Railway Projects Overseas**

With the achievement of the world's most advanced railway rolling stock manufacturing technology, China was considered ready to start its efforts to send China's railway overseas. What made China confident to go out was when China believed that they had the capability to the railway technology. Other than that, China has already seen the opportunity of international market that the demand of railway will increase in the future.

China's railway projects and technology transfer overseas are evidenced in the bilateral activity between China and countries all over the world such as Turkey, Russia, United States, and several countries in Southeast Asia. The first overseas railway was built in Turkey in 2014. In Turkey, China had successfully built a 533-kilometers-long railway linking Turkey's capital Ankara with Istanbul. The railway cost was USD4.1 billion, it was The China Railway Construction Corporation and the China National Machinery Import and Export Corporation which winning the bid in 2005 and made a consortium with Turkish Cengiz Construction and Ibrahim CecenIctas Construction(Qin, 2014). The construction was completed and opened service in 2014, despite the incident of sabotage, blockade, and slowdown. Although it was not a high-speed train (only 110 km/h top speed), the projects was obviously become a path for China to impose any other big infrastructure projects in Turkey.

Russia will become the country to host one of the most advanced rail system technology in the world. On June 2016, a batch of 100 high-speed train-set with the top speed of 400 km/h are about to produced in Russia. The agreement has been signed by Russian Railways, Sinara Group, China Railway, and Chinese state-owned CRRC. The CRRC will take the responsibility over design, planning, quality control and technical support of the rolling stock. Out of USD15 billion price estimations, China has already agreed to give loan of USD6 billion which cover railway's construction, geological research and improvement of the economic structure. The 770 kilometers-long high-speed railway will run across seven districts via 15 stops and could cut the usual travel time between regions from 12 hours to 3 and a half(Grey, 2016).

China has also successfully made its first agreement related to railway with the United States in September, 2015. The agreement was a form of joint-venture between China Railway International USA and XpressWest to run a project of railway connecting Las Vegas to Los Angeles (Southwest Rail Network). The estimated USD100 million high-speed rail project will approximately have 370 kilometers-long and expected to drive the new economic development and to stimulate the tourism industry in the region. The China Railway International USA (which including China Railway International, China Railway Group Limited, CRRC Qingdao Sifang, China Construction America, CREEC USA, and CRSC International) will be included in the responsibility on design, building, finance, and operation towards the project. The project construction planned to start as soon as September 2016 (China Railway International U.S.A, 2015).



China has been maximizing its efforts to dominate the world with its rail technology by continue to pursue and approach countries that wants to enter the era of high-speed railway. Recently, China's railway has targeting the Southeast Asia market. The Southeast Asia region was considered to have the biggest potential that their development process will increase the demand of railway technology.

### **B. China's Railway Projects in Southeast Asia**

Southeast Asia, which integrated in the ASEAN, has entered the era of new economic development. The fast growth of economic in the region has pushed Southeast Asia's countries to upgrade its infrastructure, especially railway. The condition of railway technology in Southeast Asia was far left behind. The high-speed rail technology required wide gauges (such as 1.6 meters) while Southeast Asia is using narrow gauge which less than 1.4 meters. Moreover, other condition such as slope, tracks, and curve radius make it unsuitable for building high-speed rail. Therefore, the countries in Southeast require new system to build high-speed rail (Shang-su, 2015). Other than that, the bad geographical and environment in Southeast Asia can become barriers for trade activity such as in Indochina region there are terrain and harmful environment, in Indonesia and the Philippines is worse that with archipelago country they are having much problem on the connectivity. Thus the need for railway hoped to counter the obstacle. With the good trade flows, the common market envisioned by the region can be realized (Orchard, 2016). The high-demand of railway technology was evidenced by ASEAN member countries, which seven out of ten members has been showing

desires to have its own high-speed rail within the country. The seven members are Indonesia (Jakarta-Bandung high-speed rail), Laos (Vientiane-LuangNamtha railway), Malaysia and Singapore (Kuala Lumpur-Singapore high-speed rail), Philippines (Malolos-Tutuban railway), Thailand (Bangkok-NongKhai railway and Bangkok-Chiang Mai high-speed rail), Vietnam (Hanoi-Ho Chi Minh high-speed rail), and Myanmar (Yangon-Kunming railway).

China's railway competitor, Japan, has also showing its interest over countries who offer assistance and finance on railway. The railway projects in Southeast Asia are the result of Japan and China rivalry. Japan, which already assisting many railway projects in Southeast Asia, has started to send the Shinkansen technology. The Philippines, Thailand, and Vietnam are the countries that will adopt the Shinkansen technology over its railway projects. With the Japan loss in Indonesia, China then holds Indonesia, Laos, and Thailand to become countries to host its railway technology. Thailand is the only country to host both Japan and China in different route of railway projects.

Many countries in the world are in their phase to enter the high-speed railway era, Southeast Asia countries are no exception. Thus, China has already prepared its efforts to enter Southeast Asia market. To enter Southeast Asia market, China's railway should win bidding among other railway company. The projects in Indonesia, Laos, and Thailand are the evidence of China's effort to realize its mission sending railway overseas. From the projects, China has been through many negotiations and has showing effort and willingness by giving high tolerance in risk and offer to guarantee major share of the project cost(Orchard, 2016).

Below is the explanation about railway projects in the countries that has made agreement with China, which is Indonesia, Laos, and Thailand.

#### **4. Indonesia**

As the most populous country in the Southeast Asia, Indonesia has served the largest economy in the region. In terms of GDP, Indonesia has the largest nominal among Southeast Asia countries and has joined the G-20. However, Indonesia is still considered as third world country with its number of poverty. Indonesia is in its efforts to stimulate the domestic economy. The development of Indonesian economy is hampered by several factors such as overpopulation, unemployment, and bad infrastructure. Nowadays, Indonesia still relying its economic on the foreign trade. China has seen this potential that Indonesia need to enter the era of high-speed railway to balance its growing economy.

In July 2015, a plan to build high-speed railway in Indonesia was announced by the government. The project was expected to become the first high-speed railway project in Southeast Asia. Both Japan and China has showing interest towards this project. Japan has already conducting a research towards the possibility of the railway which will connect Indonesian capital city, Jakarta to Bandung and Surabaya. In the same year, Indonesian government then organized a “beauty contest” between Japan and China. The beauty contest intended for both countries to present its high-speed railway technology, the third party will involved to judge and the winner will be awarded the with the projects of Jakarta-Bandung high-speed railway(Sihite & Mega, 2015).

In result, China was selected by Indonesian government to build the first high-speed railway in the country, outbidding Japan. The government finally chose China over Japan because China could provide a guarantee-free loan which made the project business-to-business basis, with Indonesia will hold 60 per cent of the joint-venture interest while another 40 per cent holds by China. A business-to-business basis is one of China's efforts to attract Indonesian government over Japan that need government funding made the project government-to-government basis. Another reason for Indonesia to accept China's railway is the commitment of China to finish the project by 2019, in conjunction with the end of JokoWidodo's era and Indonesian general election (Jakarta to Bandung High-Speed Rail, 2015).From Jakarta-Bandung high-speed railway, Indonesia is expected benefits such as generating thousands of jobs (when creating), boosting industries and manufacturing related to railway, and increasing the activity and development in surrounded region, both rural and urban area(Jakarta to Bandung High-Speed Rail, 2015).

### **Figure 1. Project Profile of Jakarta to Bandung High-speed Rail**

1. Track length : 150 kilometers-long
2. Top speed : 200 km/h and 250 km/h
3. Travel time : 36 minutes
4. Estimated cost: USD5 billion (75 per cent from CDB)
5. Company : CRRC (China Railway Rolling Stock Corporations) and Indonesian SOEs consortium; PT WijayaKarya (construction company), PT KeretaApi Indonesia (railway operator), PT JasaMarga (for toll-road builder), and PT Perkebunan Nusantara VIII (plantation)

### **5. Laos**

Laos is one of Southeast Asia country which has direct borders with China. For China, Laos has seen as the gate towards countries in Southeast Asia region. Therefore, the development of transportation and infrastructure should meet the demand for better flows of goods and services between China and Southeast Asia. For this, China has been targeting Laos for its purpose of sending railway technology.

For the result, in December 2015, the construction of 427 kilometers-long railway linking Vientiane and LuangNamtha (near the border of south China) has begun. It was a difficult projects because there will be 162 bridges and 72 tunnels need to be built to cross the train. Towards the project, China is taking the 70 per cent of contribution and another 30 per cent will be funded by Laos's government. There is also the extension of route towards this project as it was intended to be the gate for China to Southeast Asia. The 507 kilometers-long railway was connecting Kunming (China) and Mohan (Laos) are under construction on its second section(Gerin, 2015).

**Figure 2. Project Profile of Vientiane to LuangNamtha Railway**

1. Track length : 427 kilometers-long
2. Top speed : 160 km/h
3. Estimated cost: USD6.8 billion
4. Company : CRRC (China Railway Rolling Stock Corporations), China Railway Materials Co., Ltd. (CRM) and China Railway Corporation (CRC)

## **6. Thailand**

Thailand is one of countries in Southeast Asia who become a target for China to send its railway technology. China showed its ambition to build a high-speed railway in Thailand due to the strategic geographical position of Thailand and the tourism potential in the country. Thailand also already showed the interest to modernize its rail network and also the need to help boosting the weak of export in the country. The project was officially launched at the Chiang Rak Noi Station in central Thailand's Ayutthaya province at December 2015 (China-Thailand Railway Project, 2015).

The new railway line will extend across Thailand (from Bangkok to NongKhai) to connect with Vientiane and Kunming in China. The 873 kilometers-long railway line will be divided into 4 sections: 133 kilometers-long line from Bangkok to KaengKhai, 246.5 kilometers-long line from KaengKhai to Map Ta Phut, 138.5 kilometers-long line from KaengKhai to NakhonRatchasima, and 355 kilometers-long line from NakhonRatchasima to NongKhai (China-Thailand Railway Project, 2015).

The successful of China in sending its railway technology in Thailand and Laos are expected to not only increase the economic development in surrounded

region passed by the rail network but also to reduce the cost of logistic and increase the trade activity between China and countries in Southeast Asia. However, Thailand was also agreed to adopt Japan's Shinkansen system in its 670 kilometers-long railway that will connect Bangkok to Chiang Mai, making China is not the only one who dominate Thailand railway(Kyodo, 2016).

**Figure 3. Project Profile of Bangkok to NongKhai Railway**

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| <ol style="list-style-type: none"><li>1. Track length : 873 kilometers-long</li><li>2. Top speed : 180 km/h</li><li>3. Estimated cost: USD12 billion (USD5.1 billion for first phase)</li><li>4. Company : CRRC (China Railway Rolling Stock Corporations), XCMG (Xuzhou Construction Machinery Group) for constructions and mining equipment, LiuGong, Sany Heavy Industries</li></ol> |
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From the explanations above, started from the history to projects conducted overseas, it has reflected a rapid development of China's railway whether domestically or internationally. The development of China's railway was once going in the slow pace before the government really aware about the important of the infrastructure for the economy. After being able to make its own railway and high-speed railway technology, only from 2004 until 2014 China has been successfully realizing its ambition to bring its own high-speed rail technology overseas. Since 2014 also, only in the period of two years, China has been successfully joined in railway projects in countries around the world. Even in Southeast Asia, China has showing its courage to enter Southeast Asia region which requires China to deal with Japan's railway technology. However, China's efforts has shown success by conducting railway projects in Indonesia, Laos, and Thailand by giving better and more flexible offer. By seeing the efforts in railway

projects in Southeast Asia, China should have more comprehensive reasons instead of merely helping the development in recipient countries. China actually wants to take more advantages for sending its railway overseas, especially seen from its efforts in Southeast Asia region. Thus, China's reasons for its efforts in railway projects in Southeast Asia will be explained more in the next chapter.