

## Southeast Asian Port Development: Policy and Initiatives Towards Achieving 2030 Agenda on Sustainable Development Goals

### *Pembangunan Pelabuhan di Asia Tenggara: Polisi dan Inisiatif Ke Arah Mencapai Agenda Matlamat Pembangunan Mampan 2030*

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#### ABSTRACT

Ports are catalyst for economic growth and development of countries including in Southeast Asia where more than 90% of cargos are exported by sea. Port of Singapore, Port Klang and Port of Tanjung Pelepas are classified as mega ports in the region while other ports such as Laem Chabang, Manila, Tanjung Priok and Ho Chi Minh ports are classified as national gateway ports. Following the declaration of a new 2030 Agenda on Sustainable Development in 2015, the Heads of States and Government and High Representatives are committed to achieving sustainable development in its three dimensions; economic, social and environment in a balanced and integrated manner. For Southeast Asian countries, the target under SDG17 that is to strengthen the means of implementation and revitalize the global for sustainable development is crucial where SDGs can be met within the framework of revitalized global partnership for sustainable development. The aim of this study is to discuss the policy and other initiatives taken by the maritime sector in selective countries in Southeast Asia in order to achieve the 2030 Agenda on Sustainable Development including its SDG17. Finding indicates that it is crucial for ports globally include in the Southeast Asian region to adopt sustainable development concept in its policy and port management in line with the 2030 agenda on the sustainable development, not only to minimize the impact of ports on environment but also community, safety and security as well as strengthening the port governance in the era of the “new normal”.

*Keywords: Port; sustainable development; policy; environment; new normal*

#### ABSTRAK

Pelabuhan adalah pemangkin kepada pertumbuhan dan pembangunan negara-negara termasuk di Asia Tenggara di mana lebih daripada 90% kargo dieksport melalui laut. Pelabuhan Singapura, Pelabuhan Kelang dan Pelabuhan Tanjung Pelepas adalah dikategorikan sebagai pelabuhan-pelabuhan mega, manakala pelabuhan-pelabuhan seperti Laem Chabang, Manila, Tanjung Priok dan Ho Chi Minh dikategorikan sebagai pelabuhan ‘gateway’. Berikutan dengan deklarasi Agenda 2030 Pembangunan Mampan pada tahun 2015, semua Ketua-ketua Negara dan Kerajaan dan Perwakilan Tertinggi komited untuk mencapai pembangunan mampan dalam tiga dimensi iaitu ekonomi, sosial dan alam sekitar dengan pendekatan seimbang dan berintegrasi. Bagi negara-negara Asia Tenggara, matlamat pembangunan mampan yang ke 17 (SDG17) iaitu untuk memperkuat kaedah perlaksanaan dan memberi keutamaan kepada matlamat pembangunan mampan, boleh dicapai dalam kerangka kerjasama global untuk pembangunan mampan. Tujuan kajian ini adalah untuk membincangkan pembentukan polisi dan lain-lain inisiatif yang telah diambil oleh sektor maritim di sebahagian daripada negara di Asia Tenggara dalam usaha mencapai Agenda 2030 Pembangunan Mampan termasuk matlamat pembangunan mampan 17 (SDG17). Penemuan penting menunjukkan adalah kritikal bagi sektor pelabuhan untuk mengaplikasikan konsep pembangunan mampan di dalam polisi serta pengurusan pelabuhan yang bukan sahaja dapat mengurangkan impak pelabuhan ke atas alam sekitar, malahan ke atas komuniti, keamanan dan keselamatan di samping dapat memperkukuhkan lagi tadbir urus pelabuhan terutama dalam era “norma baharu”.

*Kata kunci: Pelabuhan; pembangunan mampan; polisi; alam sekitar; norma baharu*

#### INTRODUCTION

Ports are critical infrastructure assets that serve as catalysts of economic growth and development. In addition to playing a key role in international trade, they create jobs, generate wealth and value,

contribute to national gross domestic product (GDP) and promote the expansion of related and nearby industries and cities (UNCTAD 2017). Ports act as gateways to trade, providing access to global market for all countries, including those that are landlocked, for example Laos in Southeast Asian region.

Apart from enhancing ports performance, ports worldwide need to address the changing dynamics in the maritime transport including meeting the heightened global sustainability agenda such as Sustainable Development Goals (SDGs). Creating value for a port's surrounding economy in a sustainable way should be a centre to any development (IAPH 2019). In 2018, ports around the world signed the World Ports Sustainability Program (WPSP) declaration which aims to contribute to the SDGs, whilst a number of national port master plans have started to include social along with environmental standards (Jansen et al. 2018). The American Association of Port Authorities (AAPA), the European Sea Ports Organisation (ESPO), the Worldwide Network of Port Cities and the World Association for Waterborne Transport Infrastructure (PIANC) signed up as Founding Partners of the WPSP.

International maritime trade continues to be influenced by internal and external factors that will have an impact on overall global maritime growth. Reflecting developments in the world economy and trade activity, international maritime trade lost momentum in 2018 (UNCTAD 2019). Trade tensions and protectionism topped the list, followed by the decision by the United Kingdom of Great Britain and Northern Ireland to leave the European Union (Brexit), the economic transition in China, geopolitical turmoil and supply-side disruptions, such as those occurring in the oil sector (UNCTAD 2019).

Despite the gloomy global trade scenario, in 2018 Asia continued to account nearly two thirds of such activity dominated by China with a total of 260.8 million thousand 20-foot equivalent units (TEUs) recorded including Hong Kong, and Taiwan Province of China. Asian ports continued handled 63% of global containers. In general, key factors contributing to higher volumes, included strong growth on the intra-Asian trade route, improved consumer demand in the United States and Europe, and an increase in North-South trade volumes, which was supported by higher commodity export earnings in Africa and developing America, thus stimulating imports (UNCTAD 2018). In 2019, three major alliances (2M, Ocean Alliance and The Allaiance) controlled 80% of the total container shipping capacity (Rodrigue 2020).

While port activities continue to facilitate commercial and economic growth, it also likely will continue to have an impact on environment

and will likely cause deterioration of air and marine water quality in the surrounding areas. The impacts on surface water quality are caused by generated sewage, bilge wastes, sludge, oil discharges and linkages of harmful materials both from ships and port activities (Roh et al. 2016). So, it is important for authorities to continue collaborate with shipping companies to reduce environment damage they produce. Therefore, ports must plan and manage their operations in a sustainable way in order to achieve sustainable port in line with the SDGs and to reduce the negative impact of ports activities upon surrounding environment.

Despite the current and difficult time due to COVID-19, a vast majority ports have succeeded to stay open to cargo operations, while majority remain close to passenger traffic. The global health and economic crisis triggered by the pandemic has upended the landscape of maritime transport and trade and significantly affected growth prospects (UNCTAD 2020). Mid and long-term recovery will need to further enhance sustainability and resilience of maritime port and shipping industry (UNCTAD 2020). Global container maritime trade volume which declined in 2020 due to COVID-19, is expected to gradually recover from 2021, with annual average growth of 5.8% until 2025 and 4.6% in 2030. The global port volume is estimated to reach 1,076 million TEUs in 2025 and 1,213 million TEUs in 2030 (ESCAP 2021).

In addition, a number of international developments continued to contribute to the implementation of the 2030 Agenda for Sustainable Development such as Paris Agreement under the United Nations Framework Convention on Climate Change and the Sendai Framework for Disaster Risk Reduction 2015-2030. These instruments provide the foundation for sustainable, low carbon and resilient development in a changing climate (UNCTAD 2019). According to General Assembly resolution 72/73 of 5 December 2017 proclaiming the United Nations Decade of Ocean Science for Sustainable Development 2020-2030, that ocean science will be key developing effective measures for coastal protection and coastal zone management, as well as climate-risk assessment, adaptation and resilience-building for seaports and other coastal transport infrastructure. The prime sources of the environmental impact of seaports include pollution to port-related constructions and operations. These includes air emissions of ships at berth, terminal handling equipment such as cranes and yard

equipment, and logistics and industrial activities in the port (Notteboom & Pallis 2021).

Therefore, this article discusses selected Southeast Asian countries policies and initiatives to promote port sustainability in their maritime policy planning such as Singapore, Malaysia, Thailand, Vietnam, Indonesia and the Philippines.

#### GLOBAL PORTS DEVELOPMENT AND COVID-19

Before the pandemic COVID-19 impacted global economy in March 2019, maritime industry continued to contribute to the expansion of global trade. Leading global ports are mainly from Asia where most of them located in China, such as Port of Shanghai and Port of Hong Kong (UNCTAD 2019). These ports are well connected with global market and played a critical role in serving as a catalyst to economic growth of the nation. Although growth is important, it is proven in the case of China that high economic growth and flourishing domestic and international trade has resulted in increases

consumption and pollution of water resources.

Apart from China, Southeast Asian ports continued experienced positive growth, reflecting positive economic performance in countries of the Association of Southeast Asian Nations (ASEAN) (Idris & Hussein 2017). Table 1 shows Southeast Asian ports growth at individual ports varied from 0.4% in Port Klang, 6.4% in Port of Tanjung Pelepas (PTP), and 8.7% in Port of Singapore. The Port of Singapore ranked first in the region (second in the world) with 36 million TEUs, Port Klang, Malaysia ranked second (12 in the world) with 12.32 TEUs and PTP, Malaysia ranked third (18th in the world) with 8.8 TEUs. Meanwhile, Port of Laem Chabang (LCP) ranked fourth (22 in the world) with 8.07 TEUs and Port of Tanjung Priok ranked fifth (23<sup>rd</sup> in the world).

Overall, global port productivity is very much related to their ability to handle the deployment of larger vessels. This factor had impacted other ports performances globally including in the region such as Laem Chabang Port, Manila Port and Viet Nam Port that contributed to the decreased in productivity.

TABLE 1. Leading 20 global container ports, 2018 TEUs

Port	Economy	Throughput 2018	Annual Percentage Change 2017-2018
Shanghai	China	420 010 000	4.4
Singapore	Singapore	36 000 000	8.7*
Ningbo-Zhaousan	China	26 350 000	6.9
Shenzen	China	25 740 000	2.1
Guangzhou	China	21 920 000	7.6
Busan	Korea	21 660 000	5.5
Hong Kong	China	19 600 000	-5.6
Qindao	China	19 320 000	5.5
Tianjin	China	16 000 000	6.2
Dubai	UAE	14 950 000	-2.9
Rotterdam	Netherlands	14 510 000	5.7
Port Klang	Malaysia	12 030 000	0.4*
Antwerp	Belgium	11 100 000	6.2
Xiamen	China	10 700 000	3.1
Kaoshiung	China	10 450 000	1.8
Dalian	China	9 770 000	0.6
Los Angeles	USA	9 460 000	1.3
Tanjung Pelepas	Malaysia	8 790 000	6.4*
Hamburg	Germany	8 780 000	-0.2
Long Beach	USA	8 070 000	3.7
Total		524 210 000	

\*Southeast Asian ports (+ growth)

Source: Review of Maritime Transport, UNCTAD (2019).

The China-ASEAN economic relations have grown dramatically, benefiting from the dynamism of their economies, liberalization of their trade (Abdul Rahman 2018). If ASEAN is a single entity it would rank the 6<sup>th</sup> largest economy in the world behind the United States, China, Japan, France and Germany. Export-led growth is central to the economic progress and well-being of Southeast Asian countries. Generally, as export rise, carbon emissions tend to rise. Therefore, international trading systems that help address the challenge of sustainable port development need further investigation.

With the COVID-19 and the climate change emergency negatively impacting the three dimensions of sustainable development (economic, social and environment), what the world needs is more coherent policy mix to protect the planet and ensure more inclusive development (UNCTAD 2021). The pandemic COVID-19 has substantially impacting people lives and livelihood and putting extreme stress to socioeconomic systems (Yusuf & Sarifin 2020). Therefore, as part of efforts aimed at reducing the international spread of the virus and to mitigate the potentially crippling longer term consequences of the pandemic, especially for the most vulnerable countries, policy-makers need to take a number of measures to ensure the facilitation of the international trade and transport of goods (UNCTAD 2019). In April 2019, UNCTAD had outlined 'A 10-point Action Plan' to support the logistics and international trade include ensure uninterrupted shipping, maintain ports open, protect international trade and goods and speed up customs clearance and trade facilitation, facilitate cross-border transport, ensure the right of transit, safeguard transparency and up-to-date information and go paperless.

#### PORTS AND SUSTAINABLE DEVELOPMENT GOALS

The right understanding of the concept of sustainable development is the first step to be taken by any sectors before decided to adapt it in their management planning and in this case the port sector. As debated in many literatures upon various concept of sustainable development, overall it offers a broad principles and complex concept and inherently unclear, yet defining the concept is a great task (Lee 1991, Mensah & Casadevall 2019). As Gray (2010) and Mensah et al (2018) pointed out, in the attempt to move beyond sustainability rhetoric and pursue a more meaningful agenda for sustainable development, a clear definition

of this concept and explanation of its key dimensions are needed. There is no common philosophy of definitions on sustainable development as reaching consensus is a complicated. The need to handle the environmental initiatives began in the early 1970s had shifted to wider aspects including economy and social in 1980s.

In 1983, Brundtland a former Prime Minister of Norway, chair of the UN World Commission on Environment and Development, which in 1987 issued *Our Common Future* the report that introduced the idea of 'sustainable development' and led to the first Earth Summit in Rio de Janeiro in 1992 (United Nations 2011). The report was the first focused on global sustainability which explicitly addressed the links between social, economic and environmental dimensions of development. In terms of approach, sustainable development is an approach to development which uses resources in a way that allows them (the resources) to continue to exist for others (Moheildin 2017). Other scholar like Evers (2017) relates the concept to the organizing principle for meeting human development goals while at the same time sustaining the ability of natural resources and ecosystem services upon which economy and society depend. Today, the term is very commonly used where most of them agreed that the concept of sustainable development is based on three dimensions of economic, social and environment.

The other new terms such as 'Green' and 'Blue' economy concepts also have been introduced at the international level as part of the broader concept of sustainable development that focusing on the marine and coastal activities and the protection of oceans that produce an economic output (World Bank & UNDESA 2017). Blue economy comprises of maritime economic activities such as maritime transport, fisheries and coastal tourism. A variety of 'green' terms were used in construction industry such as 'green construction', 'green project' and so on (Nor Kalsum et al. 2017).

Following the declaration of a new 2030 Agenda on Sustainable Development in 2015, the Heads of States and Government and High Representatives are committed to achieving sustainable development in its three dimensions in a balanced and integrated manner. They were also committed in achieving the non-achieved track of Millennium Development Goals (MDG) that has been agreed in 2000. The SDGs and its 17 targets are integrated and indivisible, global in nature and universally applicable, taking into account different national realities, capacities and levels of development and respecting national

policies and priorities (United Nations 2016).

The question to be raised is all 17 Goals related to sustainability of ports in Southeast Asian region? And what are the tools, methodologies, guidance are needed? Given the diversity in policies and regulations adopted by countries globally, the SDG 17 goal should be taken seriously by governments in their planning for any developments. Among the SDGs that can be directly or indirectly associated with sustainable port development are as listed below (Table 2).

This method has been suggested during the meeting on Sustainable Port Development of Port Industry in Ningbo, China, in 11<sup>th</sup> July 2019. For Southeast Asian countries the target under Goal 17 that is to strengthen the means of implementation and revitalize the global for sustainable development

is crucial where SDGs can be met within the framework of revitalized Global Partnership for Sustainable Development. The importance of Goal 17 has been highlighted and supported during the third International Conference on Financing for Development, held in Addis Ababa, from 13 to 16 July 2015, which is integral part of the 2030 Agenda for Sustainable Development. Environmental sustainability has become a priority on the global policy agenda including in maritime transport. Today, climate change is one of the greatest challenges to sustainable development. Increase in global temperature, sea level rise, ocean acidification and other climate change impacts are seriously affecting coastal areas and low-lying coastal countries including many least developed and small island developing states (IPPC 2018).

TABLE 2. Sustainable Development Goals (SDGs) targets and port governance

GOALS	TARGETS
Goal 3.	Ensure healthy lives and promote well-being for all ages
Goal 5.	Achieve gender equality and empower all women and girls
Goal 7.	Ensure access to affordable, reliable, suitable and modern energy for all
Goal 8.	Promote sustained, inclusive and sustainable economic growth, full and productive
Goal 9.	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10.	Reduce inequality within and among countries, cities and human settlements inclusive, safe, resilient and sustainable
Goal 11.	Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12.	Ensure sustainable consumption and production patterns
Goal 13.	Take urgent action to combat climate change
Goal 16.	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institution at all levels.

Source: The International Association of Ports and Harbors (2019)

At the same time protecting ports from impact of climate change and variability is crucial. The implementation of activities and measures that can support the shift to greener and more sustainable ports will have cost implications and will require further funding, the development of new capabilities and the promotion of new technologies and their transfer, especially to developing countries include in Southeast Asian region (UNCTAD 2019).

#### POLICIES AND OTHER INITIATIVES TOWARDS ACHIEVING SUSTAINABLE PORT DEVELOPMENT IN LINE WITH THE SDGS IN SOUTHEAST ASIA

The role of global ports is changing throughout history. Ports are no longer played a traditional role

by providing space for shipping activities and storing area. Today, port areas are the interface between the city and the sea. It is where the processes of economic globalization started with the involvement of many stakeholders such as shipping companies and logistics company provider. However, sustainability issues in the field of shipping, port, maritime logistics, commonly known as maritime transport and logistics industry have historically received less stakeholder's attention, as compared to aviation and overland freight sectors (Paul Tae-Woo Lee et al. 2019).

Most ports in the region namely in Singapore, Malaysia, Thailand, Vietnam, and Indonesia are pursuing port development to improve challenges in the port logistics sector and expand insufficient supply capacity. In these countries port development is recognized as a driving force for national and

regional economic development, as it can bring economic effects such as revitalization of related industries, enhancement of value added, job creation, and application of new technologies through port development (ESCAP 2021). In addition to these economic effects, port development also serves as hub for eco-friendly policies through the introduction of the sustainable policies. For example, the port and shipping industries in Singapore accounts of 7% of GDP and 10% of the service sector.

There is also a regional initiatives taken by ASEAN as a regional organization, to promote sustainable development in maritime transport include shipping, port and logistics (Figure 3). At the international level, all countries need to abide with the protocols and regulations adopted by the IMO in association with United Nations Conference on Law of the Sea (UNCLOS) on safety, environment and pollution. IMO has great influence in maritime transport since 1997 in adopted several protocols and regulations in association with the UNCLOS. The 2030 Agenda for Sustainable Development recognize each country has primary responsibility for its own economic and social development. The new agenda also deals with the means required for implementation of the Goals and Targets include the mobilization of financial resources as well as capacity-building and the transfer of environmentally sound technologies to developing countries on favorable terms, including on concessional and preferential terms, as mutual agreed (United Nations 2015; Idris 2021).

#### SDGS AT NATIONAL LEVEL

Overall, individual countries in the region acknowledged the importance of sustainable development as a critical aspect of port strategy, planning and investment which contributes to stable long-terms revenue and benefits employees, local community and regional development. As ports are contributed to the national economy and urban development, a sustainable port would enhance both regional and national economic development. Given the complexity of the countries in the region, each country will have different approaches in responding towards sustainable port development and integrate it into the national development agenda.

The increasing need to provide modern ports and cargo-handling facilities with terminal management and security systems has substantially increased capital and technical requirements of ports globally include in the region (Idris &

Hussin 2018). Consequently, greater collaboration between the private and public sector has become necessary especially in the developing countries as there is an urgent need for ports to move towards sustainability. Private partners acting on the basis of concessions is, on the other hand, responsible for terminal operations and related investments such as superstructure, equipment, cranes and wharf expansion (UNCTAD 2017). Some private terminal operators are also expanding their investment beyond ports into hinterland connectivity. Investors in port developments are predominantly global port managements companies such as AP Moller-Maersk Group, Port of Singapore and Hutchison Whampoa. Most companies continue to invest in mega hub ports in the region such as Singapore Port, Port Klang and PTP in Malaysia. Recently, there are also extending their investment in emerging economies like Viet Nam in providing infrastructure and facilities (Idris & Hussin 2018).

#### SINGAPORE

Singapore is a port city that relies heavily on maritime transport, port and shipping activities in generating income for the country given its limited small size island in Southeast Asia. There are annually more than 130,000 ships calling at Singapore with a total shipping tonnage of more than 2.5 billion GT in 2015 (Xiao & Lam 2017). In 2011, the Maritime Port Authority Singapore (MPA), became the world's first maritime administration to launch a comprehensive pro-environment initiative known as the Maritime Singapore Green Initiative (MSGI). In 2019 the MSGI was further extended until December 2024 and enhance to focus on decarbonization of shipping and it is comprises of four programmes namely, Green ship Programme, Green Port Programme, Green Energy and Technology Programme and Green Awareness Programme (Ministry of Transport, Singapore 2021).

The building of the Tuas Mega Port is the next significant landmark in the port of Singapore evolution. The sustainable port has being built in four phases, with the 20 million 20ft TEUs first phase and second phase set to open in 2021. Upon completion of the forth and final project phase, scheduled after 2040, Tuas terminal will be the largest terminal in the world with a total capacity of 65 million TEUs annually. Sustainability is integral to the construction of Tuas Port. From planning to implementation, Tuas Port will be resilient port where it provides a single consolidated location for Singaport's container

activities, which significantly reduces inter-terminal haulage operations and GHG emissions (WPSP 2019). Beyond the physical port, Tuas Port will be a digital automated port. Together with the Maritime Green Initiative, Tuas Port is positioned to be the resilient port of the future (WPSP 2019).

Singapore has continuously pursue to achieve sustainability in the maritime industry. In 2019, the MPA have launched the first sector-specific Maritime Sustainability Reporting Guide (Maritime Sustainability Reporting Guide 2020). Challenges of the future demand significant change, increasing the need to address sustainability risks throughout maritime businesses' operations such as growing

protection, corporate governance, energy sector development, environmental performance, technology advancement and climate change. Progressive effort are being put in by the maritime sector in Singapore to curb the carbon footprint and improve the environmental performance of international shipping based on latest regulation including IMO 2020 regulation that seeks to reduce the emission of Sulphur oxides (SOx) which is harmful to human health by mandating that the Sulphur content of fuel oil used on board ships should not exceed 0.50 % m/m on and after January 2020 and IMO 2050 Greenhouse Gas Target (Maritime sustainability Reporting Guide 2020).



FIGURE 3. The role of national, regional and international bodies towards a formulation of policies in line with the sustainable development concept in Southeast Asia

Source: Author's observation

### MALAYSIA

Malaysia also has recognized the concept of sustainable development and has embedded the concept in its policies, visions, missions and plans but there is a weakness in the realm of sustainable development which has been cited frequently. This weakness has been regarded as the absence of comprehensive approaches or framework towards sustainable port development (Omidreza Saadatin et al. 2016). Realising ports were a strategic asset in nation-building, the Malaysian government formulated a port strategy in the Eleventh Malaysia Plan (2016-2020) (Hup 2021). In general, Malaysia has taken a few initiatives which using broader

approach to access sustainable development as follows which enable different institutions and organization, assess the level of sustainable development:

1. Malaysia Quality of Life Index (MQLI), 1999, updated in 2004
2. Malaysia Urban Quality of Life (MUQL), 2002
3. Compendium of Environment Statistics, 2001
4. Malaysian Urban Indicator Network (MURNINet)
5. Malaysia Sustainable Development Approaches at State Level
6. Green Building Index (GBI), 2009
7. Roadmap to System Environmental-Economic Accounting (SEEA), 2016-2020

All approaches except MQLI are very much emphasis on environmental issues and sustainability into all aspects of planning and management, thus limit the achievement towards overall sustainable development goals. MQLI has been developed by the Economic Planning Unit (EPU) of the Prime Minister in 1999 and was updated in 2004 and has encompassed 14 rubrics. It is an assessment approach that has viewed the subject at national level due to the majority of rubrics related to social, economic and environmental sustainable development approach include air quality index, deforestation, clean water index, income, working life, transportation and communication, health and education.

However, the nation's position as the regional transshipment hub is constantly challenged by international development such as the IMO's conventions on better facilities for shipping and use of cleaner fuel (Hup 2021). To comply with these requirements, Malaysia's ports and their respective authorities have set up port community networks and green port system. Malaysia is also encourage to promote green concept and use of resources in a sustainable manner (Rekan et al. 2019). Currently, under the Ministry of Transport, only a few major ports in Malaysia namely Westport, Port Klang, Pasir Gudang Port and Port of Tanjung Pelepas are moving forward towards sustainable port with the implementation of Green Port Policy. The Green Port Policy outlines some simple principles, strategies and practices in areas where port development and operation can be both environmentally friendly and commercially viable.

The Green Port Policy will be a catalyst towards more sustainable port development in Malaysia (Johor Port Authority 2014-2020). The policy guiding principles are among others to protect the community from harmful environmental impacts as a result of port operations, to maintain a balance between the environment, social and economy in any port planning, development and operation, to inculcate sustainability within the framework of the organization focusing on increasing awareness and the use of sustainable materials or technologies, to provide principal direction within the port towards environmental compliance and conservation and to prevent pollution and improve personal, community and environmental health. Through the green port system some of the ports are converting diesel RTG to electric RTGs and provide more shore supply services to vessels at berths (Hup 2021). The authorities are encouraging vessels plying in Malaysian waters to use low Sulphur fuel.

## VIET NAM

Viet Nam is one of the fastest growing ASEAN countries in Southeast Asia with an average rate expansion of 6.2%, 2013-2017 (OECD 2020). It is forecast to grow at about 6.5% in the medium term. Similar growth found in container throughput for Vietnamese ports. Vietnamese port managers appreciated the importance of sustainable development as a critical of port strategy, planning and investment which contribute to stable long-term revenue and benefits employees, local community and regional development (Roh et al. 2016). For Viet Nam, collaboration with business partners to optimize operations planning is still at the initial implementation stage. The country has established a master plan for port development with aim of 2030, and continue to promote port development (Idris 2012; Idris & Hussin 2018). The total port volume increased from 73 million tons in 2000 to 514 million tons in 2018, and container traffic also increased from 1.1 million TEUs in 2000 to 6.33 million TEUs in 2018. This is because the foreign investment is increasing according to the potential as a global production base following China and the domestic market with 100 million people.

## THAILAND

In the case of Thailand, all ports are under the administration of Port Authority of Thailand (PAT). Thailand is concentrating on the development of five ports in preparation on the continue increase in port traffic volume. The LCP, Thailand's gateway and Bangkok Port, the main port in the metropolitan area, is being developed complementarily (UNESCAP 2021). Since 2013, the container throughput of Thai seaport experience continual increase every year from 7.5 million TEUs in 2013 to 8.2 million TEUs in 2016.

In 2015, PAT published the latest Annual Report and had projected future strategic plan for port operation of all state own port in Thailand. Green Port Policy was specified as one part of PAT environmental operations under the PAT Enterprise Plan No.11 for fiscal year 2015-2019 (Teerawattana & Yang 2019). The LCB was set as a pioneer for the "Green Port" project followed by Bangkok Port. The Key Performance Indicator (KPI) for the initial project is to reduce CO<sub>2</sub> emission at 10% when compared with CO<sub>2</sub> emission in 2013. In terms of port development, the PAT has almost completed implementation of the LCP Phase 1 and



2 developments. LCP Phase 3 is being planned to cover construction of all the port infrastructure and related facilities necessary to support the volume and scale of various types of vessels, including the latest super-post panamax container vessels.

#### INDONESIA

The implementation of sustainable port in Indonesia is a great challenge due to its large size. The country possesses 17,000 islands scattered throughout the Indonesian archipelagic state. With 95,000 km coastlines, Indonesia has more than 2000 ports and terminals (Ministry of Transportation, Indonesia 2013). Thus, the scale and character of Indonesian ports are varying widely (Idris & Hussin 2018). They range from major international ports handling tens of millions of tones annually to small ports serving local communities that handled a few thousand tones (OECD 2012). Responding to the need to improve Indonesian port competitiveness, the Indonesian Government is amid planning and implementing broad policies and strategies concerning maritime and port development. Current Indonesian President, Joko Widodo envisions Indonesia as a Global Maritime Nexus, involving 34 ministries and 425 policies which range from maritime diplomacy, maritime connectivity, marine industry, maritime security and nautical culture (Sari Wahyuni et al. 2019).

Tanjung Priok is one of the major seaports in Indonesia and was selected as a pioneer port for sustainable development in the country. In 2015, United Nations Environment Program (UNEP) together with University Gadjah Mada University Centre of Transportation and Logistics Studies, had developed a project to support a development of clean ports program in the Port of Tanjung Priok, Jakarta. The project resulted in first ever baseline Air Emissions Inventory (AEI) conducted in Indonesia (UNEP 2015). After completed of the New Priok Container Terminal One (NPCT1) in the first phase in 2016, the next stage is the construction of New Priok Container Terminal Two (NPCT2) and New Priok Container Terminal Three (NPCT3).

#### THE PHILIPPINES

Port of Manila is located at the west end of the City of Manila and facing directly to Manila Bay. The port is divided into South Harbour, Manila International Container Terminal (MICT) and North Harbour. Overall, Manila port is not progressing well like other

regional ports due to lack of physical infrastructure, terminal, berth facilities and connectivity with the hinterland as well as with other regional hub ports like Singapore and Malaysian ports for their international trade (Idris & Hussin 2018). The port ranked 25 on top 30 world ports in 2000 but was dropped out from the list in 2010 (UNESCAP 2021). There is an urgent need for modernization of the port and to address new trends emerging in the shipping sector such as sustainability, especially in serving the new high capacity container vessels that will demand, deeper draft, new handling equipment, enhanced berth productivity and expanded yard facilities (Idris & Hussin 2018). For future development, the Manila Port is projected to handle 10 million TEUs in 2025 and 12 million TEUs in 2030 which is lower than the targets decided by other major ports in the region.

#### SDGS AT REGIONAL LEVEL

During the APEC Leaders 14<sup>th</sup> meeting held in Hanoi, Vietnam on 18<sup>th</sup> November 2006, ASEAN leaders had initiated APEC Port Services Network (APSN). APSN was established under the auspices of APEC in 2008, supported by APEC Transportation Ministerial Meeting and all member economies. Currently 18 member economies have joined the APSN as Council Members including Australia, Canada, Hong Kong, China, Korea, Indonesia, the Philippines, Singapore, the USA and Russia. The aims of APSN are to promote economically and environmentally sustainable ports by strengthening cooperation, developing best practices and guidelines, enhancing supply chain effectiveness, building capacity and stimulating information and personnel exchange among port and port-related industries and services in the Asia Pacific Region with the goal of liberalization and facilitation of trade and investment to achieve common prosperity of the APEC member economies.

Since then, various conferences and workshops have been conducted from 2009-2019 as shown in Table 4. From 2016 to 2018, few ports have been awarded under the Green Port Awarded System (GPAS) including Bangkok Port, Jurong Port, Port Klang, Port of Singapore and Port of Tanjung Pelepas. GPAS program is a green evaluation system for ports in the APEC region developed by APSN. It represents an integral part of APSN's ongoing effort to promote the green growth of the APEC port industry.

TABLE 4. APSN conferences and workshops 2008-2019 towards sustainable development

Year	Conference and Workshops
2009	Port Facilities Security, Tianjin, China
2009	Conference on Port Development, Shenzhen, China
2010	Free Trade Zone at Ports, Shanghai, China
2011	Green Port, San Francisco, USA
2012	Green Shipping and Supply Chain, Hong Kong, China
2013	Green Ports, Time for Action and Innovation, Phuket, Thailand
2014	Gateway Ports and Supply Chain Connectivity, Seattle, USA
2015	Improving Port and Supply Chain Activity, Cebu City, the Philippines
2016	Safety of Dangerous Goods at ports, Penang, Malaysia
2017	Restructuring Shipping and Port Industry, Trends and Challenges, Ho Chi Minh, Vietnam
2018	GPAS workshop, Beijing, China
2018	APEC Port Connectivity Forum, Singapore
2019	Digital Innovation and Port Connectivity, Cuzco, Peru

Source: The APEC Port Services Network (2019)

The vision for ASEAN Connectivity 2015 is to achieve a seamlessly and comprehensively

connected and integrated ASEAN that will promote competitiveness, inclusiveness, and greater sense of community (Idris & Hussin 2018). Based on this, ASEAN has prioritized five strategies area for Master Plan of Connectivity (MPAC) 2025 such as sustainable infrastructure, digital innovation, seamless logistics, regulatory excellence and people mobility as shown in Figure 5. More than USD110 billion needs to be invested annually for sustainable infrastructure in ASEAN in order to meet the needs of the ASEAN Member States as shown in Figure 6 (MPAC 2025 2016).

Given the size of the investments requirements of many projects and the constraints on ASEAN's Member States' budgets, there is a need to mobilise resources from other sources, including private sector. Despite rapid growth, domestic capital markets in most ASEAN Member States currently provide limited opportunities to source project finance for infrastructure projects, particularly outside Singapore, Thailand and Malaysia (MPAC 2025 2016). The financial aspects thus are very crucial towards resilient infrastructure and to strengthened the port governance in most countries in the region (Idris 2021).



FIGURE 5. ASEAN Connectivity 2025  
Source: Master Plan on ASEAN Connectivity 2025 (2016).



FIGURE 6. Sustainable Infrastructure-ASEAN Connectivity  
SOURCE: Master Plan on ASEAN Connectivity 2025 (2016).

#### SDGS AT INTERNATIONAL LEVEL

While shipping activities still a major concern in terms of new regulation, very little research done on current port issues internationally, especially when ports are undergoing changes in their institutional and regulatory framework. Furthermore, ports have evolved into port networks that comprise the deep sea port with hinterland connections and inland ports (Notteboom & Rodrigue 2007). Since the major concern is still on environment a few researches have been conducted on the green and sustainable port strategy, which built on the key constructs of stakeholder involvement, green market development, cost-effective green policy, and sustainable port operations and developments (Lam & Voorde 2012).

After its' first launched in 2018, WPSR continue to contribute to the sustainable development of world ports in Mac, 2019 (WPSR 2020). The WPSR has the ambition to empower port community actors to engage with business, government, and societal stakeholders in creating sustainable added value for local communities in their regions. The WPSR programmed has accumulated the most coherent and up to date global database of port-related projects on sustainable development. The practical examples given by each project can serve

as an inspiration for ports seeking to integrate the UN Sustainability Development Goals into their strategy and day-to-day business (WPSR 2020). The theme 'Resilient infrastructure' aims at anticipating both physically and digitally demands of maritime transport and landside logistics, as being resilient in changes in whether conditions whilst at the same time developing in harmony with local communities, nature and heritage (WPSR 2020).

A main issue of concern to industry in 2018 was the new regulation which came into force on 1 January 2020 of the IMO regulation calling for a new 0.50% global Sulphur cap on fuel content (IMO 2020). Enforcement, compliance with and monitoring of the new Sulphur limit is the responsibility of States party to the International Convention for the Prevention of Pollution from Ships (MARPOL), 1973, as modified by the Protocol of 1978 (MARPOL 73/78), Annex VI. MARPOL Annex VI enters into force on 1 March 2020. Ships went operating outside the existing ECA and SOx emissions (Baltic, North Sea, North America & US Caribbean) any fuel oil used on board shall not exceed 0.50 percent sulfur content (MARPOL Annex VI 2020).

Another regulations-MARPOL Annex VI Regulation 13 entered into force on 1 January 2021. IMO Resolution on MEPC.286 (71) introduces two

new NOx Emission Control Areas (ECA) in the Baltic Sea and North Sea, which require Tier III engines for ships operating in those areas, which are constructed (keel lying) on or after 1 January 2021 or have 'non-identical' replacement engines or additional engines installed (MARPOL Annex V1, 2020). Ships found to be not in compliance may be detained by port State control inspectors, and/or sanctions may be imposed for violations (UNCTAD 2019). Environmental reporting is becoming increasingly important for ports in the face of growing environmental concerns and stakeholder pressure from market players, public bodies and social interest groups.

Accordingly ports and ships had made effort to demonstrate their commitment to environmentally-friendly shipping and port activities through its full compliance with a series of legislation of IMO and EU (UNESCAP 2021). In line with this, ports globally including some selected ports in the Southeast Asia have been undertaking comprehensive approach to prepare the maritime and port industry for the Sulphur limit regulations, including regulatory frameworks, technical guidance and stakeholder engagement.

## CONCLUSION

Overall maritime transport (port and shipping) has received less attention by stakeholders in terms of sustainable development as to compare to land transport and aviation. Ports in the Asia-Pacific region are subject to the national policies that aim not only to efficiency handle with the increasing cargo volume, but also to foster the port as a base for economic development, social integration, and environmental protection (UNESCAP 2021). Ports in the region namely Singapore Port and Port Klang are classified as mega/hub ports, while others like Laem Chabang Port, Ho Chi Minh, Tanjung Priok and Manila are classified as national gateway ports. As outline in the United Nation 2030 Agenda on Sustainable Development, Southeast Asian countries are not exceptional in planning towards sustainable port development in their management.

Since port development requires enormous investment and is a long-term national project, careful review and preparation are essential from planning to completion and actual operation. Emphasises should not be given only on environmental sustainability although it will have a positive impact on safety of workers but it should cover the whole cycle of port development by implementation of the sustainable

development concept. The COVID-19 has been a health and economic crisis of tragic proportion of lives and livelihoods everywhere and threatens to derail our aspirations for the world we want by 2030 (UN Trade Forum 2021). So it is crucial for all players in the maritime industry including central and local government, port authorities, stakeholders, private sectors and non-governmental organisation to cooperate towards long-term policy planning for sustainable port development in line with the SDGs that will not only have significant impact in reducing port pollutions on environment but also in terms of financial sustainability, resilient infrastructure, safety and security as well as strengthen the port governance in the era of the "new normal".

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