

ASEAN Focus

A QUARTERLY PUBLICATION PROVIDING CONCISE ANALYSES AND PERSPECTIVES ON ASEAN MATTERS

Pondering Southeast
Asia's Future
Beyond COVID-19

Bracing for the US-
China Trade War

Is ASEAN Ready to
Deal with Climate
Change?

Climate Action
Through Landscape
Design

Life on the Water in
Southeast Asia

Advancing Climate Resilience in ASEAN



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ISEAS-Yusof Ishak Institute (formerly Institute of Southeast Asian Studies) is an autonomous organisation established in 1968. It is a regional centre dedicated to the study of socio-political, security, and economic trends and developments in Southeast Asia and its wider geostrategic and economic environment. The Institute's research programmes are grouped under Regional Economic Studies (RES), Regional Social and Cultural Studies (RSCS) and Regional Strategic and Political Studies (RSPS). The Institute is also home to the ASEAN Studies Centre (ASC), the Temasek History Research Centre (THRC) and the Singapore APEC Study Centre.

Editorial Notes

The coronavirus disease 2019 (COVID-19) swept across the globe in the first quarter of 2020. The pandemic has thus far claimed more than 8,810 lives worldwide, a fatality rate of about 4% of the more than 218,800 people infected. Southeast Asia's deep and extensive interconnectedness has meant that it has not been spared either, with at least 1,900 of the region's inhabitants testing positive for the coronavirus. The numbers are expected to increase in the coming weeks and months as more countries update their figures everyday. Fears of COVID-19's further proliferation have resulted in the postponement of the Special ASEAN-US Summit, which was slated to be held on 14 March in Las Vegas.

Apart from the human cost, the outbreak has caused enormous cascading economic losses to the global economy, with ASEAN member countries among the worst hit. Manufacturing supply chains, which rely mainly on intermediate inputs from China, have been delayed and disrupted; aviation, tourism, and retail have ground to a halt as public fears take hold and travel bans are put in place. In this issue's *Analysis*, Mr. Bilahari Kausikan ponders the possible futures of Southeast Asia after the COVID-19 crisis in three inter-related dimensions: economics, politics and geopolitics.

While the outbreak of COVID-19 more than ever requires international cooperation for control, mitigation and treatment, US-China strategic competition continues unabated despite the recent conclusion of their phase-one trade deal in January. The deal – which includes provisions for China to spend US\$200 billion more on US goods over the next two years and for Chinese authorities to clamp down on intellectual property theft, in exchange for a reduction in US tariffs – aims to mitigate the damaging effects of the ongoing trade war. Yet, it remains to be seen if the deal will achieve its objectives, and in the process take some pressure off ASEAN's trade and supply chains. Dr. Malcolm Cook shows how the trade frictions between the US and Japan in the 1980s might hold a lesson for how ASEAN member countries may respond to the current US-China trade conflict to boost their economic fortunes. This issue also features the insights of Dr. Can Van Luc, Dr. Evelyn Shyamala Devadason, Dr. Medhi Krongkaew, Ms. Selena Ling, and Dr. Siwage Dharma Negara, on how ASEAN and its major economies have been faring under the shadow of the trade war.

In line with Vietnam's commitment to preserve the prominence of sustainability in its ASEAN Chairmanship goals, this issue shines *Spotlight* on "Advancing Climate Resilience in ASEAN". Ms. Sharon Seah Li-Lian gives an overview of climate change's effects on the region,

and how ASEAN institutions should step up regional action to deal with such vulnerabilities. Next, Mr. Haakon Fossum Sagbakken, Dr. Indra Overland, Ms. Monika Merdekawati, Dr. Hoy-Yen Chan and Mr. Beni Suryadi explain the nexus between climate change and security in the region. Dr. Hendricus Andy Simarmata unpacks the implications of rising sea levels on ASEAN metropolises while Dr. Albert Salamanca sheds light on the less noticed challenge of ocean acidification in the region. Dr. Paul Teng highlights the imperative for Southeast Asia to sustain an agricultural and productive natural resource base to ensure food security amid climate change. Finally, Ms. Melinda Martinus explores how the ASEAN Smart Cities Network could provide a regional platform for local governments to make their cities more climate resilient.

To provide greater depth to this discussion, this issue's *Insider Views* celebrates individual action and local advocacy that make meaningful difference to climate change adaptation and mitigation. We are honoured to feature Ms. Kotchakorn Voraakhom, founder of the architectural social enterprise The Porous City Network and profiled by TIME Magazine for her climate activism, especially through landscape design. In addition, *ASEAN in Figures* provides the latest data on climate change risks and impacts in the region.

The focus on climate change once again reminds us of the ubiquity and importance of water in Southeast Asia as the region's fortunes wax and wane with the flows of its rivers and seas. In this issue's *Sights and Sounds*, Ms. Anuthida Saelaow Qian immerses herself in the waters of riverine and coastal communities across the region, while Mr. Glenn Ong dives into the many destinations of ecotourism that Southeast Asia has to offer for the adventurous yet ecologically responsible traveller.

Last but not least, we bid a fond farewell to Dr. Tang Siew Mun, who served as the Head of the ASEAN Studies Centre and Managing Editor of *ASEANFocus* from October 2015 to February 2020 with distinction and dedication. The ASC team are grateful for Dr. Tang's sterling leadership for the past half-decade, and his friendship and good cheer will be sorely missed. We wish him the very best in his future endeavours. Yet, the new year also brings a new member to the ASC family. We are delighted to welcome Dr. Sithanoxay Suvannaphakdy as Lead Researcher (Economic Affairs). 🌊

Speculations on Southeast Asia After COVID-19

Bilahari Kausikan ponders the many futures of Southeast Asia beyond the COVID-19 crisis.

Everything eventually ends. What will Southeast Asia and ASEAN look like when this pandemic runs its course? Historically, all pandemics have had economic and political effects. This essay speculates about the long-term impact of COVID-19 on Southeast Asia in three inter-related dimensions: economics, politics, and geopolitics.

COVID-19 seems to have plateaued in China. Beijing first bungled by trying to cover up, allowing the virus to take hold in China and rapidly spread beyond its borders. But the draconian measures only a Leninist system is capable of taking brought it under control, albeit at great cost, not all of which was borne by China.

The global epicentre is now in Europe. Infections are rapidly spreading in the US. Like China, the West fumbled its initial responses. Democracies are slow to react until shocked into action. But these systems are resilient, have strong economic, scientific and administrative capabilities, and have begun to mobilise. The costs to everyone will again be great. But there is no question that they will eventually get a grip on the disease and bring it under control in their own way.

But is this the beginning of the end, or only the end of the beginning? Will there be a second wave of infections as Chinese migrant workers return to work after an enforced absence? Or when Western systems relax uncharacteristic restrictions on individual liberties? What will happen if weak healthcare systems in Africa, the Middle East, India, and Indonesia are overwhelmed?

Nobody really knows.

Economics

Even before COVID-19, slowing Chinese growth had a global impact. The pandemic has now also exposed the vulnerabilities of over-reliance on Chinese supply chains. Diversification had already begun before the pandemic because of US-China trade tensions and security restrictions the US had placed on Chinese technology companies. But the concerns have now extended to sectors that are not necessarily security sensitive, such as automobile parts and active pharmaceutical ingredients.

Some corporations are already hedging their China risks. What is not clear at present is the *extent* to which foreign manufacturers and suppliers will or can reduce dependence on China.

Japan's decades-long search for a viable 'plus one' for its 'China plus one' strategy suggests that it will not be straightforward to diversify out of China. Much depends on how quickly China can restore production and whether China's recovery will be 'V-shaped' or 'U-shaped'. We do not know. It was much simpler for the Chinese Communist Party (CCP) to command a halt to production than for it to decree that production resume.

Supply chains within China have also been disrupted and will take time to restore. Not all migrant workers have returned to work. As of mid-March, studies by JP Morgan and Citigroup Global Markets indicate that while economic activity is picking up steadily for large



Ramping up mask production in Hubei, China to meet COVID-19 demands

KinkarkinPhoto@Shutterstock



Overstocked watermelons waiting to be 'rescued' due to Vietnam-China border gates closure

enterprises, it is still significantly below pre-COVID-19 levels for small and medium enterprises (SMEs). More than 90% of Chinese enterprises are SMEs which account for 60% of China's GDP and 80% of jobs.

Assuming there is no second outbreak of COVID-19, SMEs too will eventually return to normalcy. Given their impact on social stability, SMEs have received special attention in the support and stimulus measures aggressively rolled out by the CCP. But this may enhance existing systemic risks to the Chinese economy. Chinese policymakers must balance contradictory considerations in the context of a global economy. As the disease takes hold in Europe and the US, global demand will slow, affecting China's growth.

In the worst case, sequential and mutually reinforcing contractions in China, the US, and Europe could cause a global recession. If this occurs, there will be little reason to diversify supply chains until the global economy recovers. A global recession could be prolonged. Since the 2008 financial crisis, the scope for stimulus measures by central banks of key economies has been reduced with interest rates already very low and most major economies running huge budget deficits.

Conversely, if the worst case is avoided and China's economy bounces back quickly, there will be less immediate incentive to diversify. In short, it is not to be taken for granted that there will be a *significant* effort to diversify supply chains out of China, although *some* diversification will certainly occur.

Southeast Asia can provide an alternative production platform. Some firms have already shifted production to avoid American tariffs and rising costs in China. But moving to Southeast Asia is not automatic. Bottlenecks in infrastructure and skilled labour need to be addressed. Regulatory frameworks in areas such as tax, labour regulations, and justice systems will have to be made more business friendly. American security concerns will need to be addressed.

Politics

Economic downturns create and enhance political uncertainties. The 1997 Asian economic crisis catalysed

Suharto's fall in Indonesia; the dismissal and jailing of then-Prime Minister Mahathir Mohamad's deputy, Anwar Ibrahim, in Malaysia; and in Thailand, it had a profound impact on economic and social systems that ultimately brought a non-traditional leader, Thaksin Shinawatra, to power, arousing the distrust and anger of the traditional Thai political elite, leading to two coups.

More than two decades later, the consequences of these events are still playing themselves out. Indonesia, Malaysia, and Thailand, together with Vietnam and perhaps the Philippines, are the ASEAN members that could potentially benefit most from whatever diversification may occur – provided they get the fundamentals right. Will they?

Prime Minister Lee Hsien Loong of Singapore has said that the economic impact of COVID-19 could be worse than that of the 2008 global financial crisis. Dr. Mahathir said much the same thing, referencing the 1997 Asian financial crisis. If they are right, there are bound to be political consequences even if their precise nature cannot now be predicted, all the more so if a global recession cannot be avoided.

The current political situations in Indonesia, Malaysia, and Thailand are already tenuous. The future political and policy trajectories of Myanmar and the Philippines, which face elections this year and 2022 respectively, are uncertain. How Cambodia will evolve after Hun Sen is anyone's guess. The only ASEAN members where basic political continuity can be assumed with some confidence are Brunei, Singapore, Laos, and Vietnam. This is not a situation conducive to great optimism about the region's ability to optimise the potential opportunities.

Geopolitics

China and the West have both been materially damaged by the COVID-19 crisis; both will eventually recover. When the pandemic eventually ends, the relative power equation between the US and its allies and China is unlikely to be fundamentally altered. Strategic competition – and the complexities and constraints it imposes on Southeast Asia – will continue.

The US and China will remain important and influential regional actors that cannot be ignored, although trust in both is low, as several surveys have consistently demonstrated. The pandemic may enhance regional mistrust of both. Middle powers like Japan, the ROK, Australia, and India will continue to play their own roles. Formal US allies may seek more autonomy to pursue their own interests within the alliances. Japan is already moving in that direction.

That the relative power balance will not immediately change does not mean that the pandemic will have no strategic effects. Neither the US nor China has resisted the temptation to use the pandemic to try and score petty propaganda points against each other, behaving like kindergarten kids trading insults. This only sharpens US-China tensions. But domestic considerations are paramount for both sides.

The CCP is using nationalism to repair the domestic reputational damage it has suffered. Having started a forest fire, China is now trying to capitalise on its ability to contain the fire it started, offering aid and advice to other affected countries, contrasting itself with the US, in the hope that its own responsibility will be overlooked. However, more pronounced internal censorship and the increasingly laudatory depiction of Xi Jinping's role suggests that the CCP is having difficulty convincing its own people, let alone others. China's weakness as well as its strengths are now more evident to all.

China's economic slowdown may make fulfilling the commitments Beijing made in Phase One of the trade deal difficult. The Trump administration may ratchet up tensions as the presidential campaign heats up and the economy cools. Its incoherent response to COVID-19 could well do what it was doubtful that the Democratic Party could by itself achieve: deny Trump a second term. Trump will need a distraction and is unlikely to resist the temptation of using China as a scapegoat. The Democratic candidate will also not want to appear 'soft' on China. If the next President is a Democrat, tensions may well be enhanced as human rights and labour issues may loom larger in US calculations.

Over the medium term, the supply chain vulnerabilities and diversification – if indeed such an effort materialises in any significant way – will strengthen the hand of those in the US who advocate 'decoupling' and perhaps even facilitate decoupling in certain domains. Domain-specific decoupling is already occurring to some extent. Southeast Asia is already confronting the dilemmas this entails.

However, interdependence between the US and China and other major economies – which has been underscored by the speed with which the virus spread to the US and Europe – makes across-the-board systemic decoupling highly improbable, unless the pandemic drags on for years or the virus mutates into a more lethal form that causes even greater panic. The consequences for Southeast Asia will then be profound.

But the most significant long-term geopolitical changes may occur even if there had been no pandemic or if it quickly subsides. We are still at the beginning of 'the fourth industrial revolution'. As they develop, new technologies such as AI and 3D printing could erode the cost advantages of widely distributed supply chains.

Whole industries could well be 'brought home', driven by domestic political considerations of the major economies, rather than strategic, security, or supply chain-risk management concerns. New calculations of interests by major powers could relegate Southeast Asia to a global backwater of interest only to contiguous or regional powers. This will fundamentally change ASEAN's strategic environment.

As supply chains shrink or vanish, the development prospects of less developed ASEAN members may be seriously limited. Others may be snared by the middle-income trap. ASEAN's project of making Southeast Asia a common production platform could become of little interest to the major economies. If supply chains bring little competitive advantage, why is a regional production platform needed?

ASEAN's essential purpose is to manage the primordial diversities that divide Southeast Asia and complicate relations between its members. Regional economic cooperation has been ASEAN's overarching project since 1967. If this becomes irrelevant while growth in some members stalls, what will this mean for intra-ASEAN bilateral relations? Whither then ASEAN? The region's trajectory could take an entirely new direction. Will Southeast Asia once again be regarded as 'the Balkans of Asia'? 🇲🇻

Mr. Bilahari Kausikan served in Singapore's Ministry of Foreign Affairs for 37 years and retired as Ambassador-at-Large in 2018.



All Apple retail stores outside China closed until 27 March 2020 due to COVID-19

Roundtable: Southeast Asia Bracing for the US-China Trade War

Who stands to win or lose from the US-China trade war in Southeast Asia? *ASEANFocus* invites regional experts to shed some light and debunk some myths about the trade war's complex impact on the region and their respective national economies.



CAN Van Luc

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Regional Perspectives

AF: How has the US-China trade war repositioned Southeast Asia in the global supply chain?

LING: Since the trade war emerged in March 2018, more than US\$470 billion of trade in goods has been tariffed by both sides. To dodge the tariffs, and driven by concerns over increasing production costs in China, the process to shift manufacturing production bases from China to other markets, including Taiwan, Vietnam and Thailand, has speeded up. Some multinational companies such as Fitbit, Samsung, Sony, Google, and Apple, have announced their transfer of all or parts of their production lines from China to other countries, especially for those tariff-related products. Vietnam appears to be one of the biggest beneficiaries.

Foreign direct investment (FDI) into the region has increased over the past year, especially for Vietnam. In particular, China has become Vietnam's top source of FDI, with the funds headed mainly for the manufacturing sector. The challenge now is to hang on to these companies by proving that Southeast Asia has comparable sophistication against China's advanced manufacturing technology, especially in the areas of robotics, 5G, and artificial intelligence, among others.

We also see a shift back to localisation of supply chains as a result of rising protectionism. For instance, more Taiwanese businesses have decided to return to Taiwan – over 140 Taiwanese enterprises have repatriated with the investment amount exceeding TW\$600 billion (about US\$20 billion). This shift has helped to upgrade its domestic production chain, particularly in high-tech industries like semiconductors. These include some well-known brands like Foxconn Technology Group, Inventec Corp., Quanta Computer Inc., and Compal Electronics Inc., which have established new factories or increased their investments in Taiwan.

AF: What is the possibility of US-China economic decoupling, and how would it affect Southeast Asian economies?

LING: The potential damage from a full-fledged US-China economic decoupling may be longlasting and traumatic, not only for both countries which account for around 40% of global GDP, but also for the rest of the world, especially trade-dependent economies like Singapore. A more fragmented world would likely reshape how governments, businesses and individuals conduct their day-to-day operations. For instance, the

US Commerce Department's proposal to prevent imports of any new technology deemed as a "national security threat" could divide technology orbits for 5G standards and technologies. With the lingering US-China trade war, some multinational firms have established regional or localised production bases for targeted markets to avoid tariffs. For example, some global firms have adopted a China-plus one model, where manufacturing in China is targeted for the Chinese market, and diversified to another manufacturing base for other markets.

Asian economies may start to look towards intensifying trade within the region. With the forthcoming conclusion of the Regional Comprehensive Economic Partnership (RCEP) in 2020, that longer-term structural shift may already be in motion. Regardless of the development or progress of US-China trade talks, regionalisation may continue to grow in importance for three reasons.

First, protectionism seems to be in the ascendant and increasingly entrenched. Countries like China and South Korea are likely to increase their control and development over core or sensitive technologies, and may establish more localised industrial chains to stabilise the supply after experiencing negative shocks due to recent trade conflicts. Second, technological developments, including 3D printing and automation, might help to replace low-skill intensive tasks effectively, which likely reduces the importance of the horizontal division of labour. Third, alongside more efficient information flow and rising demand for customised products, localised production can minimise the transportation required and have more flexibility to cater to rapidly changing consumer demand.

AF: What do you think of the US-China phase-one trade deal?

LING: While the phase-one trade deal has been signed, some emerging factors may complicate future trade talks. One example is the US' passage of the Hong Kong Human Rights and Democracy Act, which requires the US State Department to conduct an annual review of Hong Kong's special status, and potentially impose sanctions on officials involved with human rights abuses in Hong Kong. Prior to this, some Chinese entities were also added to the US blacklist for abuses in Xinjiang. Huawei remains another tricky issue for bilateral relations. Hence, the next phase of the trade negotiations may be even more difficult to achieve, given both sides' fundamental differences on non-trade issues like technology and human rights. Moreover, 2020 will be an election year for the US, so the noise may be ratcheted higher, especially since there appears to be bipartisan support for a tougher stance on China.

AF: Moving forward, do you think deepening ASEAN economic integration would help ASEAN member states cope with the US-China economic competition? If yes, in what ways?

LING: Intra-ASEAN trade now accounts for the largest share of ASEAN's total trade at 23%, and intra-ASEAN FDI accounts for 15.9% of the region's total FDI inflows.

While there is still a lot of reliance on the Chinese and US markets, moving into a regional self-sustaining economic system can encourage better integration, provide a better shield against global headwinds, and build economic resilience. This is not to say that ASEAN should delink or trade less with the US, China, or other major markets. Rather, increased economic integration can help buffer against existing and future global economic uncertainties.

ASEAN is now a significant global player in its own right, and has become one of the few bright spots in the currently sluggish global economy. ASEAN's standing as the fifth largest economy in the world, with a combined GDP of US\$3 trillion in 2018, a trade powerhouse with a total trade of US\$2.8 trillion, and a compelling investment destination attracting US\$154.7 billion, is not to be understated. The ASEAN Economic Community Blueprint 2025 highlights how ASEAN will further its economic integration by deepening and broadening existing areas of cooperation, and focusing on areas relevant to the region. All these will have to be done against the backdrop of geostrategic shifts towards a multipolar global governance, the Fourth Industrial Revolution, digital transformation, pressures facing multilateralism, and rising sustainability concerns.

Adding to this, the RCEP involves all ten ASEAN countries and five of its major trading partners, namely Australia, China, Japan, New Zealand, and South Korea. Together they account for nearly one-third of global population and GDP. The RCEP could generate immense economic potential through market and job opportunities, drive a transparent, rules-based framework for trade and investments to help safeguard the stability of key production networks and regional supply chains, and ultimately cement ASEAN's central economic role.

Country Perspectives

AF: How has the US-China trade war impacted the economic growth of your country?

NEGARA: Although Indonesia's participation in the global supply chain is relatively muted, both the US and China are its important trade and investment partners. Their trade conflict has had direct impacts on Indonesian economic performance. One indicator is the decline in Indonesia's non-oil and gas imports from China by 8.75% and from the US by 6.09% since early 2018, which is associated with a weakening of investment because most of these imports are capital and intermediate inputs needed for domestic economic activities. If the trade war continues, the global economy will further slow down and investment decline continues due to increased uncertainties, which will bring a second-round impact on Indonesia. The Indonesian government has adjusted its growth projection downward as it is a challenge now to maintain even the 5% growth. The 7% growth target, which is expected to help Indonesia to move towards a high-income economy, has become more elusive.

DEVADASON: Disruptions to supply chains due to the trade war have had profound knock-on effects on Malaysia due to its high degree of direct trade exposure

to the Chinese economy, with a significant volume of Malaysia's intermediate goods exports to China. Beyond the direct trade links with China and the US, Malaysia's total trade exposure to the trade war needs to factor the indirect linkages with its other trading partners since the Malaysian economy is deeply wired into the regional production networks. What is certain now is that trade-dependent Malaysia is not resilient to the trade war shock, as its annual GDP growth has moderated to 4.3% in 2019 – the lowest level in a decade.

KRONGKAEW: There has been no specific study that isolates the effects of the US-China trade war on Thailand's economic growth. However, there are several conjectures on such effects on news media and among academic circles. A commonly accepted view is that because the trade war negatively impacts both China and the US, both of which are Thailand's largest trading partners, the Thai economy would inevitably be hurt through a fall in trade and investment. It is, however, difficult to isolate this negative impact because Thailand's economic growth has generally slowed down in the past few years.

CAN: The US-China trade war has had mixed impacts on Vietnam's economy. Its GDP growth rate in 2019 was 7.02%, which was impressive given the slowdown in global economic growth, trade tensions, geopolitical competition, and natural disasters that hit the country over the past year. The main drivers of such strong growth are the industry and services sectors, such as manufacturing, ICT, retail, finance-banking, and tourism, among others. Vietnam's trade surplus in 2019 reached a record high at US\$11.1 billion, whereas private investment also boomed with 17% growth in invested capital and 6.7% growth in FDI disbursements. On one hand, the trade war slowed down Vietnam's trade flows with exports growth at 8.1% versus 13.2% in 2018. On the other hand, it helped boost investment relocation as registered FDI from mainland China and Hong Kong in 2019 more than doubled that of 2018 to reach US\$12 billion.

AF: *How has the US-China trade war impacted the trade flows between your country and the US and China?*

NEGARA: There is some evidence of the trade war's impact on Indonesia's trade flows. The economic slowdown in China has weakened demand for Indonesian commodity exports such as coal, palm oil, iron and steel. The declining demand for these commodities also pushes down their prices further, which in turn lowers Indonesia's export revenues from China. According to Statistics Indonesia, for the period of January-August 2019, the country's non-oil and gas exports to China declined by 0.45%. Conversely, its non-oil and gas exports to the US increased by 0.48% compared to the same period of 2018.

DEVADASON: Early analyses tended to exaggerate the benefits of the US-China trade war for Malaysia in the form of trade diversion effects from both China and the US to the country. The latest statistics for 2019 show that Malaysia registered higher trade with both, with a marginal increase of 0.2% in trade with China and 5.6% with the US. However, there is no compelling evidence to directly attribute Malaysia's higher trade with the US and China to trade diversion.

KRONGKAEW: Thailand's exports to the US grew steadily from US\$26.4 billion in 2017 to US\$31.4 billion in 2019, while Thailand's exports to China fell slightly from US\$29.7 billion in 2018 to US\$29 billion in 2019. This could be an immediate result of a general slowdown in the Chinese economy generating weaker demand. However, this could also be part of a general fall in Thai export performance in 2019. It is therefore difficult to pin down the US-China trade war as the reason that has adversely affected Thailand's trade flows. In the total trade picture, Thailand's total exports and imports with the US and China continued to grow from 2017 to 2019, attesting to the little negative overall impact of this trade war to Thailand's trade flows.



CAN: The trade war has impacted Vietnam's trade flows with the US and China. In 2019, Vietnam's exports performed well with the total value of US\$264.19 billion, or an 8.1% increase. Imports reached US\$253.07 billion, up by 7%. Vietnam's exports and imports with other major trading partners also increased, except with the EU and South Korea. The US continued to be the largest export market, accounting for 23% of Vietnam's export value and also registering the fastest export growth of 27.8%. China was the largest import market with a share of 28.4%, higher than that of the 2011-2015 period by 27.2%. In 2019, Vietnam's imports from China increased by 15.3% while exports to China grew minimally by 0.35% due to China's more stringent requirements for imports to ensure goods quality and help protect domestic production. The impact might be greater if consumer goods from China to the US are imposed with higher tariffs.

AF: *Which sectors/industries in your country have been most affected by the trade war?*

NEGARA: The sectors of mineral fuels, palm oil, iron and steel have been adversely affected by slowing demand from China. On the other hand, sectors such as textile, garments, and footwear have benefited from increased US demand. This, however, might be a temporary shock due to supply-demand disruptions. Other sectors such as automotive and electronics are also affected indirectly by the trade war due to weaker derived demands from other economic activities such as the commodity sector.

DEVADASON: Early assessments indicate that Malaysia's electronics products, spared from the US' 25% tariff imposed on China, have benefited from the trade war. Indeed, electrical and electronics (E&E) exports to the US expanded by 7.7% in 2019, the highest level recorded since 2009. In the case of trade with China, Malaysia's exports of broad-based non-tariff products increased in 2019. They include paper and pulp products, palm oil and palm oil-based agriculture products, manufactures of optical and scientific equipment, and processed food. In addition, the volume of palm oil exports to China has increased, but the positive effects should be set off against the drastic drop in palm oil prices. The potential beneficiaries of the trade war therefore remain less clear cut.

KRONGKAEW: Some studies have looked at Thailand's export items impacted by US tariffs. According to a report published in the *Bangkok Post* in May 2019, there were three effects on Thailand's foreign trade performance as the trade war peaked from the first quarter of 2018 to the first quarter of 2019, namely (i) direct effects from higher US tariffs, (ii) indirect effects from being a part of China's supply chain, (iii) and substitution effects on Thai exports replacing Chinese goods in the US market. It was calculated that direct effects cost Thailand about US\$316.5 million in loss of export value, plus another loss of US\$1.1 billion from indirect supply-chain effects. However, it gained the substitution effects of replacing Chinese goods in the US market to the value of US\$637.8 million. The export items suffering from tariff increases were solar panels, washing machines, steel, automobile and automotive parts, computer parts and electronic

circuits, electrical appliances, machine and machinery parts. At the same time, many of these (such as automobile and automotive parts, electrical appliances, computer parts, electronic circuits and machinery), together with aluminium, apparel and jewellery, and flavoured food and beverage, have benefited from direct export to the US. On aggregate, there was little or no clear indication of the negative effects on Thailand from the trade war.

CAN: The most affected sectors in Vietnam include computers and electronics, phones and accessories, wood and wood products, shoes and leather products. These sectors have witnessed strong growth in exports to the US. For instance, the export value of computers and electronics, and phones/accessories to the US in 2019 rose by 111.2% and 64.4% respectively. Meanwhile, computers and electronics, and shoes and slippers exported to China in 2019 were up by 14.3% and 19.4% respectively, according to the General Statistics Office of Vietnam.

AF: *How is your government adjusting its economic development policy to brace itself for the US-China trade war?*

NEGARA: In the short term, Indonesia is searching for potential alternative export markets, such as India, Africa, the Middle East, and Latin America. In the medium to longer term, Indonesia has been trying to revitalise its manufacturing sector to boost production capacity. To do so, the government has been undertaking various deregulation and de-bureaucratisation measures to create a healthy and competitive investment climate. These measures are believed to be critical to attract the necessary capital inflow. In addition, the government continues to invest in both soft and hard infrastructure to support future growth.

DEVADASON: The trade war has triggered a renewed emphasis to build up Malaysia's economic resilience to external shocks. Therefore, the government is emphasising endogenous sources of economic growth through domestic consumption and investment. This includes policies to promote employment, support higher wages and customise investment incentives. Recognising that the trade war has morphed into a "trade-tech" war, the government is also bracing itself for the digital industrial revolution by providing tax incentives for digital technology and improving the digital infrastructure. On the external front, Malaysia is hedging to reduce its trade exposure to non-regional economies by deepening regional integration through regulatory reform related to non-tariff measures.

KRONGKAEW: Thailand is trying to expand its export markets to other regions including Europe, the Middle East, Africa, and Latin America. It is also exploring further opportunities to enter into specific free-trade arrangements and agreements with old and new trading partners. Thailand is also bracing for the abolition of the Generalised System of Preferences (GSP) on several Thai export products to the US, as well as future adverse changes in trading situations.



Chinese Vice Premier Liu He and US President Donald Trump concluding the Phase One Trade Deal

The White House @ Flickr

CAN: Vietnam continues to roll out targets, policies, and measures to improve its economic competitiveness and business environment. Particularly, the Politburo of the Communist Party of Vietnam's Resolution No.50/NQ-TW on attracting FDI in 2019 lays out new requirements for selecting FDI projects. In order to hedge risks or minimise dependencies on some large trading partners, Vietnam has been proactive in diversifying markets and partners through the new FTAs, such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the EU-Vietnam Free Trade Agreement (EVFTA), among others. The government has also implemented various measures to prevent illegal trade and investments from foreign businesses, for the sake of Vietnam's economy and its relationship with the US. Lastly, Vietnam has adopted fiscal, monetary and trade policies, attempting to make trade with the US more "balanced" to minimise the risk of being labelled a "currency manipulator".

AF: *What is the likely impact of the US-China phase-one trade deal on your country and ASEAN?*

NEGARA: There has been no clear impact from the trade deal yet. Certainly, it has lessened the tension but the market remains uncertain. This can be seen by the weak demand for exports and imports. As long as the ecosystem for open trade is suppressed, it will be difficult to expect trade-led growth like that of the 1990s and early 2000s. Moreover, China's manufacturing sector has been severely hit by the COVID-19 outbreak. For Indonesia's economy, which is closely linked to China's growth, the impact of this COVID-19 shock is likely to be more significant than the trade deal itself.

DEVADASON: Although the phase-one trade pact has rolled back some tariffs, it does not seem to guarantee any significant trade gains, as tariffs remain and continue to affect global trade. Despite some show of optimism in Malaysia, this partial deal might not matter much for the country. In fact, concerns have already been raised in

Malaysia on sustaining palm oil exports to China, given China's pledge to increase its imports of US soybeans under this deal. Though China has reassured Malaysia of its continued purchase of palm oil, it is too early to give an assessment on the trade deal's overall impact on Malaysia's bilateral trade with China.

KRONGKAEW: I think that this phase-one trade deal is a fair and forward-looking outcome. First, China's commitment to buy at least US\$200 billion worth of selected products and services between 2020 and 2021 is hardly a burden to China, given its expanding demand for these products and its favourable financial position. On the Intellectual Property section, China is now ready to embrace competition with the US on technological advancement and protection. As China is the largest export market for US food and agriculture products, the terms of the trade deal provide Beijing with an opportunity to counterbalance US influence in other areas of economic relations, especially on financial services. Indeed, this could be seen as the beginning of the end of the trade war. All ASEAN countries could and should stand to benefit from its successful implementation. However, things may take an unpleasant turn, subject to the political outcomes of the US presidential election in November 2020, and the unfolding consequences of the COVID-19 epidemic.

CAN: Overall, the phase-one trade deal is likely to bring a respite to both the US and Chinese economies. This deal should also boost global economic growth by reinforcing the confidence of investors and consumers, thereby providing positive spill-over effects on world trade and investment, which would benefit Vietnam. Conversely, some sectors or industries in Vietnam can be indirectly impacted by the deal. For example, under the deal, China agreed to import more agricultural products from the US, and as a result might have to reduce importing similar products from competing trade partners like Vietnam. It should also be noted that the likely impact of the deal depends greatly on how much commitment will be realised and the outcome of phase-two trade deal negotiations. ❏

The Benefits of Rivalry: Lessons from Previous US-Japan Trade Frictions

Malcolm Cook argues that Southeast Asia could stand to gain from the US-China trade war.

Trade wars of the past teach us that smaller, weaker powers are not simply passive victims of great power competition. Instead, some can exercise agency and gain advantage from the situation. The US-Japan trade war in the 1980s had the unintentional effect of enhancing Southeast Asia's role as a global production base and cementing the region's economic importance to Japan and the rest of the world. Unintentional, that is to the great powers, as Southeast Asian countries seized the opportunity to improve their position in the global economy. This time, the US-China trade war could have a similarly inadvertent effect of boosting the importance of some ASEAN member states as alternative production bases for Chinese and other firms, though on a more modest scale.

In the 1980s, Japan, driven by mercantilist policies, was Asia's largest economy, while the US was the world's largest. Washington pursued an aggressively unilateralist response to Japan's challenge to American economic hegemony and pressured Japan to accept "voluntary" export restraints and a sharp appreciation in the yen-dollar exchange rate, with the automobile sector being a particular focus. The rapid and widespread imposition of these unilateral measures, with threat of more, sought to reduce Japan's massive trade surplus with the US,

boost American exports, and force a fundamental reorganisation of Japan's industrial structure and international trade flows.

Japanese firms were, from the mid-1970s, already using Southeast Asia as a production base before the US decided to respond to the Japanese economic challenge. Rising labour, land and other costs, as well as Tokyo's desire to move the Japanese economy and industrial base up the value chain, had already directed significant Japanese foreign direct investment (FDI) in lower-end manufacturing towards Southeast Asia.

However, the sharp appreciation of the Japanese yen against the dollar due to the 1985 Plaza Accord agreement turned a steady stream of Japanese manufacturing FDI to Southeast Asia into a powerful river that continues to flow. The yen's sharp appreciation rapidly and permanently changed maritime Southeast Asia's trade and investment flows and position in the global economy. Japanese parts manufacturers, financial institutions, logistics companies, educational providers, and department stores followed the lead of Japan's manufacturing champions and the accompanying flow of Japanese people to Southeast Asia. Bangkok and Singapore boast two of the largest Japanese expatriate communities among cities in the world.



A Honda Automobile Thailand car assembly line



Inside an Apple factory in Thailand

Prachatai@Flickr

Today, China, driven by mercantilist policies, is the leading Asian economy that is the target of American aggressive unilateralist economic measures. Tariffs and bans on Chinese exports to the US, sanctions against Chinese firms, and the threat of exchange rate measures are Washington's instruments of choice against China, and the information technology sector is a particular focus. The rapid and widespread imposition of these unilateral measures seeks to reduce China's massive trade surplus with the US, boost American exports, and likewise compel a fundamental reorganisation of China's industrial structure and international trade flows. As with Japan before, the current US measures are unlikely to achieve the first two goals in the long run or a fundamental restructuring of China's industrial structure. However, they may alter China's international trade flows and the investment decisions of firms with production operations in China.

Early partial indicators suggest that the US-China trade war could also be having a beneficial effect on Southeast Asia. Recent United Nations Conference on Trade and Development (UNCTAD) figures show a decline in overall FDI flows globally – and particularly between China and the US – but impressive increases in FDI inflows into Southeast Asia. In 2019, total inflows to Southeast Asia reached US\$177 billion, up over 14% from 2018, whereas FDI inflows to East Asian economies as a whole fell by 21%.

As with Japan prior to the American-imposed Plaza Accord shock of 1985, China's rising labour costs and desire to move the country's industrial structure up the value chain have led to growing Chinese manufacturing FDI in Southeast Asia, especially towards Cambodia, Laos, Myanmar, and Vietnam. Since the beginning of the trade war in 2018, a number of Chinese firms have announced plans to shift or already moved existing or new production from China to Southeast Asia, particularly production for export to the US, or of goods that have been slapped with tariffs. A similar redirection is taking place by a number of foreign firms with operations in China. Undoubtedly, the uncertainties and certainties of the trade war were a factor in these difficult and costly relocation decisions. The trade war shows

few signs of ending, even if there is a change in the White House next January.

As it stands, the trade war is likely to benefit the manufacturing sector in ASEAN member economies. However, individual Southeast Asian economies can only maximise their benefits from this change in external circumstances if they enhance their production capacities, and cultivate a conducive investment and manufacturing ecosystem through incentives to draw the exodus towards them. The costs of reshoring production functions for Japanese, Korean, Taiwanese, American and European firms are comparatively lower now than in previous decades.

Back to history: Thailand, Malaysia and Singapore's efforts to improve Southeast Asia's capacity as a global production base led the region to become one of the biggest beneficiaries of the US-Japan trade war of the 1980s. Japanese auto firms' investments in Thailand turned Bangkok into the "Detroit of Southeast Asia". Malaysia became a major centre for Japanese electrical and electronics overseas investment, and Singapore the regional hub for a vast number of diverse Japanese firms. Japanese auto firms, with their production chains spanning maritime Southeast Asian countries, were a major external protagonist for reducing internal barriers to trade in Southeast Asia and the 1992 ASEAN Free Trade Agreement (AFTA).

Notwithstanding the differences in historical circumstances and contexts of the US-Japan trade conflict, the lesson of the 1980s remains relevant: ASEAN member states have demonstrated their ability to navigate the uncertainties of great power trade competition to reap benefits, and in the process deepen the regional economic integration project. ASEAN member states are now witnessing another momentous turn. They can take advantage of the present US-China trade war to improve their economic fortunes, including by redoubling efforts to transform ASEAN into a single market and production base. 🇹🇵

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Is ASEAN Ready to Deal with Climate Change?

Sharon Seah Li-Lian suggests that ASEAN adopt cross-sector and multi-stakeholder approaches to cope with climate change.



A man stands atop the ruins of houses in the aftermath of Typhoon Haiyan 2013

Erik de Castro, Reuters -
Mans Unidos@Flickr

The recently published State of Southeast Asia 2020 survey listed climate change among the top three security challenges facing Southeast Asia, outstripping traditional security concerns like terrorism and increased military tensions. More than half of the 1,308 Southeast Asian respondents saw climate change as a “serious and immediate threat to (their) well-being” whereas 44% considered climate change to be “an important issue that deserves to be monitored”. The former concern was more pronounced in countries like Indonesia, the Philippines and Vietnam where impacts of climate change are starting to bear out in the increased frequency and intensity of typhoons, tropical storms, floods and droughts.

What Does the Science Tell Us?

Land and ocean temperatures are warming at alarming rates. According to the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA), 2019 was the second hottest year on record, and the last six years (2014-2019) were the six warmest years since 1880. Similarly, the total heat content for the world’s oceans recorded as the warmest in 2019 according to a paper published in *Advances in Atmospheric Sciences*.

The tropics are more vulnerable to the devastating impact of climate change than other parts of the world. The Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5°C asserts that the highest mean temperature increases are in land and

ocean regions in the tropics. Southeast Asia’s annual rate of sea level rise has accelerated according to the 2018 World Meteorological Organization (WMO) Key Climate Indicators. A failure to limit a 1.5°C increase will result in five particular climate risks for Southeast Asia, namely (i) an increase in high heat-related mortality rates; (ii) increased risk of drought-related water and food shortages; (iii) exacerbated poverty, greater inequalities and urban-related vulnerabilities; (iv) increased risk of crop failure and lower crop production; and (v) water shortages in arid regions. According to the same IPCC Special Report, the rate of sea level rise will increase in tandem, albeit at a pace that will allow for greater adaptation for low-lying coastal areas and deltas.

Southeast Asia’s Greatest Vulnerability

The region’s population is expected to increase from 649 million in 2019 to 717 million by 2030 with a large segment concentrated in megacities. According to a 2017 Asian Development Bank (ADB) report, Southeast Asia is experiencing two particular characteristics of growth – rapid urbanisation and settlement of coastal areas. Cambodia, Indonesia, Myanmar, the Philippines, Thailand and Vietnam are witnessing a growth in population settlement in low-elevation coastal areas. Trends of rapid urbanisation and coastal settlements in ASEAN countries are likely to continue due to location of economic centres along the coasts. This is expected to increase significantly in the Philippines and Vietnam. Vietnam’s coastal population is projected to double from 43.1 million in 2000 to 80.4 million in 2060, and

the Philippines will witness a growth from 13 million to 34.9 million in the same period. The coastal populations of these countries will experience greater exposure to flooding, tropical cyclones, typhoons and particularly high sea level rise.

Apart from physical impacts, climate change can cause non-economic losses such as displacement of persons, loss of biodiversity or impacts on the nutritional value of crops. A study found that the nutritional value of rice is lowered when grown under high concentrations of carbon dioxide, and this could lead to malnutrition. The value of non-economic losses is difficult to assess, but it is recognised that they can be more significant than economic losses.

Is ASEAN Serious About Climate Change?

Given the region's extreme vulnerabilities in the increasing number of climate-related natural disasters including flooding of coastal areas, typhoons and cyclones, ASEAN has identified one of its most urgent tasks to be strengthening its own rapid response capacities in climate change adaptation and disaster risk reduction through mechanisms such as the ASEAN Agreement on Disaster Management and Emergency Response (AADMER).

Among the major multilateral environmental agreements, the UN Framework Convention on Climate Change (UNFCCC), Kyoto Protocol and Paris Agreement enjoy full participation of all ASEAN member states. They have all ratified the Paris Agreement and submitted their Intended Nationally Determined Contributions (INDCs). Many ASEAN states are in the process of reviewing and enhancing their INDCs with a view to submitting their first NDCs in 2020.

At the national level, there is an increase in the number of climate-related laws and policies that ASEAN countries have put in place to support their international obligations. For example, the Philippines passed the Climate Change Act (RA9729) in October 2009 to create a systematic framework and establish an institutional arrangement to govern climate change. Singapore's Carbon Pricing Act came into force in 2019 to regulate large industrial emitters with a view to transforming Singapore into a low-carbon economy. Looking forward, Thailand is expected to introduce a comprehensive climate change law towards end-2020.

Strengthening ASEAN Institutional Framework

ASEAN's climate change agenda began to crystallise in the 2000s with the introduction of a vision of an ASEAN Community, and subsequently in the formation of the three ASEAN community pillars. The current ASEAN institutional framework on environment and climate change is constituted under the ASEAN Socio-Cultural Community (ASCC) pillar. The ASCC Blueprint 2009 maps out regional cooperation on issues of priority and concern. Under the ASCC, the ASEAN Ministerial Meetings on the Environment (AMME) and the ASEAN Senior Officials' Meeting on the Environment (ASOEN) meet annually to discuss environment-related issues, including climate change. The ASEAN Working Group on Climate Change (AWGCC), one of seven technical

working groups reporting to the ASOEN, is tasked to enhance regional cooperation on climate change, promote collaboration between sectoral bodies, and articulate ASEAN's concerns and priorities at the international level.

However, it has become increasingly clear that climate change issues are not the sole domain of environmental ministries. At the international level, climate change is integrated and handled in different fora. Similarly, climate change intersects with energy, transport, finance, agriculture, food security, and education, among others, which involve various ASEAN sectoral bodies.

The current ASEAN institutional framework for climate change may have served ASEAN well in the early years. But as the issues become more cross-cutting and complex, a revolutionary rethink of its current institutional framework is needed on how best to coordinate and synthesise climate change issues across the different sectors in order to produce a coherent response to climate change.

Engaging Relevant Stakeholders

What is most critical at this juncture of the collective efforts to address climate change is ASEAN's willingness and ability to engage with other stakeholders, moving beyond the realm of governments and policymakers. The climate change legal regime takes a largely top-down approach where State Parties decide on how to make meaningful contributions to achieve the global goal of limiting the temperature increase to 1.5°C. Governments are encouraged to set their own mitigation and adaptation targets and communicate these plans publicly. But government efforts alone will only go that far in achieving these targets. For instance, in the area of adaptation, indigenous communities can play an important role in proposing nature-based solutions as it is far more practical, economical and ecologically sound to explore such adaptation measures than to launch large-scale and expensive infrastructural developments. Government efforts therefore must be complemented by cooperation with the private sector, businesses, cities, civil society and academia in order to address this multifaceted issue. ❧

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Climate Change, Security and Regional Cooperation in ASEAN

Haakon Fossum Sagbakken, Indra Overland, Monika Merdekawati, Hoy-Yen Chan and Beni Suryadi argue that ASEAN member states face a choice between cooperating more closely on mitigating climate change now or risking greater regional tensions in the future.

The ASEAN member states are among the world's most vulnerable countries to climate change. Some climate change impacts may have spillover effects on bilateral and regional relations in Southeast Asia. Climate change could affect human security in the region by threatening traditional livelihoods, exacerbating existing intra-state security threats, transforming territorial disputes and bilateral tensions, and straining already limited resources. This can in turn incentivise inter-state competition for scarce resources and trigger large-scale migration, exacerbating old political tensions, giving rise to new ones, and causing difficulties for integration and multilateral initiatives within ASEAN.

The Global Climate Risk Index 2020 produced by Germanwatch names the Philippines, Myanmar, Thailand and Vietnam among the ten countries bearing the greatest costs in the last 20 years from climate-induced disasters and weather events. Climate change is likely to further intensify severe weather events, with significant human and financial costs for ASEAN member states. Moreover, most of their populations are concentrated along the seaboards and on flat fertile plains threatened by sea level rise. Loss of substantial territory due to sea level rise is a major threat for Indonesia, Myanmar, the Philippines, Thailand and Vietnam. Without swift technological progress, rice yields may be 50% lower in 2100 than in 1990 in Indonesia, the Philippines, Thailand and Vietnam,

according to a 2017 study by the Asian Development Bank and the Potsdam Institute for Climate Impact Research.

The loss of agriculturally productive territory threatens food security in most ASEAN countries, as does the impact on riverine and oceanic fishing resources. The fisheries are already threatened by over-exploitation, and the acidification of oceans can harm stocks and further intensify regional competition over these resources. Furthermore, as weather patterns change, varying Himalayan precipitation will directly impact the flows of the Mekong, Salween, and Irrawaddy rivers, on which riverine communities in the Greater Mekong region depend. This might not only increase flooding, but also destabilise ecosystems and by extension fisheries. This will likely have a profound effect on agricultural communities along the region's rivers, such as in Laos, where the agricultural sector depends on the Mekong floodplains.

Loss of livelihoods may incentivise migration, both from within and outside the region. The population of ASEAN is projected to reach 770 million in 2040, according to the World Population Review, and this may further exacerbate possible migration-related and other tensions caused by climate change. While internal migration might be possible in some cases, most ASEAN member countries do not have sufficient fertile land to accommodate large influxes of people on a long-term basis.



Rohingya children in school provided by NGOs in Kuala Lumpur

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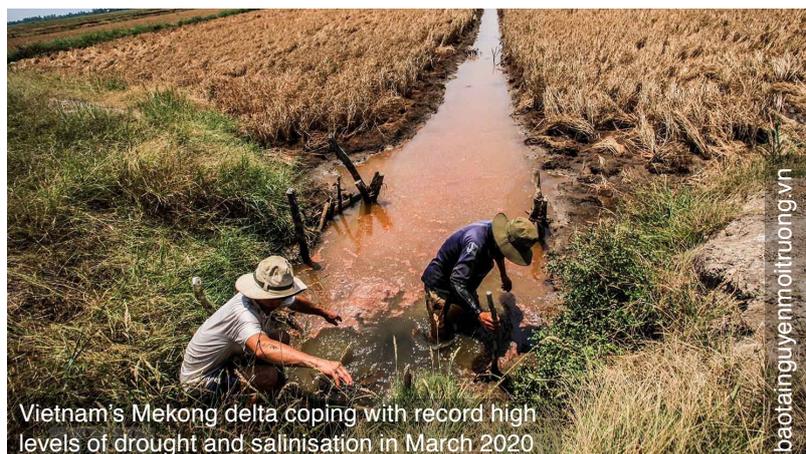
Migration is not new to Southeast Asia, especially labour migration. The status and welfare of citizens working abroad have been an area of concern in bilateral relations among regional states. For instance, around 10% of the Philippine population work abroad, with remittances constituting close to 10% of its GDP in 2019, according to the Philippine Central Bank. Irregular labour migration, refugee and repatriation issues have already caused tensions in bilateral relationships among some ASEAN member states, and migration flows of a greater magnitude could accentuate the frequency and urgency of such tensions.

Climate-induced mass migration from South Asia, particularly from low-lying Bangladesh, is a scenario that could cause significant tensions with neighbouring Myanmar or other ASEAN member states. Similarly, loss of coastal land in China raises the possibility of southward migration flows on a magnitude that could pose significant material and political challenges for Southeast Asian countries. The intractable issue of refugees, exemplified by their long-term presence in Malaysia and Thailand, as well as the recent case of the Rohingya from Myanmar, has caused tensions within ASEAN in recent years and proven a difficult topic to resolve at the regional level. Climate-induced migration flows could exacerbate such frictions.

Loss of traditional livelihoods can also make populations in impacted areas more vulnerable to recruitment by separatist and extremist groups, a recognised security threat in Indonesia, Myanmar and the Philippines, where such groups take advantage of economic grievances to boost recruitment. This equally applies to longstanding irredentist groupings and communities vulnerable to piracy, such as in the Sulu Sea between the Malaysia and the Philippines.

Geopolitically, climate change can alter the strategic calculus in the South China Sea disputes for the claimant states. Rising sea-levels might imperil man-made installations on the various reefs and island groups, while pressures on inland fisheries increase the relative importance of the fish stocks in the South China Sea. In some cases, rising sea-levels might submerge entire reefs or islands, undermining claims to Exclusive Economic Zones (EEZ) as defined in the 1982 United Nations Convention on the Law of the Sea (UNCLOS).

Aside from the direct impacts of climate change, the hitherto modest contribution of ASEAN member states to climate change mitigation may have implications for their international standing. Southeast Asia is one of the few regions in the world where coal consumption has grown in recent years, and the nationally determined contributions (NDCs) of ASEAN member states to the Paris Agreement are modest. As investors become more stringent about environmental sustainability, Southeast Asian companies and countries may lose out on much-needed foreign investment. Limited regional cooperation on climate change mitigation also exposes ASEAN and its member states to international criticism, and limits their credibility in shaping the discourse on climate justice and sustainability issues in the global arena.



Vietnam's Mekong delta coping with record high levels of drought and salinisation in March 2020

baotaiyuanmoitruong.vn

If ASEAN member states can cooperate effectively to mitigate climate change, it could preempt potential political conflicts and reputational costs, instead of allowing climate change to negatively affect regional relations and the effectiveness of multilateral cooperation. Greater tensions over migration issues and resource competition might make it more difficult to reach regional consensus, a cornerstone of ASEAN multilateralism. Climate change-induced political tensions might lower inter-state trust, which in turn can hamper cooperation in other environmental areas, such as the longstanding transboundary haze issue. Furthermore, deeper ASEAN integration in other policy fields might be further delayed as each member state struggles to adapt to a more volatile climate.

There are several policy areas where ASEAN could foster regional cooperation to counteract climate change, with the added benefit of enhancing regional trust. Firstly, the implementation of the ASEAN Power Grid (APG) should be accelerated to facilitate the expeditious roll-out of intermittent renewable energy sources such as solar and wind power by enhancing grid connectivity and utilising the region's unevenly distributed renewable natural resources. Secondly, ASEAN member governments should develop new financial incentives and market mechanisms to facilitate investments into renewable energy projects and infrastructure in cooperation with multilateral financial institutions. Thirdly, they should engage multilateral organisations and private sector stakeholders to intensify climate adaptation measures in agriculture and river management. These measures may be financially and politically difficult to implement, yet they offer a more affordable option than the predictable and unforeseen political consequences of climate change for ASEAN member states and ASEAN as a regional community. 🇰🇵

Mr. Haakon Fossum Sagbakken, Prof. Indra Overland, Ms. Monika Merdekawati, Dr. Hoy-Yen Chan and Mr. Beni Suryadi are participating researchers in the ASEAN Climate Change and Energy Project (ACCEPT) implemented by the ASEAN Centre for Energy in cooperation with the Norwegian Institute of International Affairs.

Building Transformative Adaptation to Sea Level Rise

Hendricus Andy Simarmata underlines the urgency of transformative adaptation to address sea level rise and land subsidence in Southeast Asian megacities.

Global mean sea level (GMSL) is rising and accelerating. According to the Intergovernmental Panel on Climate Change (IPCC) Special Report on the Ocean and Cryosphere last year, the GMSL per year in the 2006-2015 period was 3.6mm, compared to 2.1mm during the 1970-2015 period. Under the emission scenario with the Representative Concentration Pathway (RCP) 8.5, the projected GMSL rate will be 15mm per year by 2100. The sea level rise phenomenon requires the world to not only reduce carbon emissions but also to adapt to the future scenario, especially in the low-lying coastal cities in Southeast Asia.

Over the past decade, Southeast Asia has seen rapid and massive urbanisation. 18 out of 50 cities with a population of more than one million are located in the region's coastal area. Five of those 18 cities are metropolitan regions occupied by more than 3.5 million people which continuously grow, namely Jakarta, Bangkok, Manila, Ho Chi Minh City and Singapore. High density and large-scale urban expansion have pressured those cities to develop adaptive coastal defence strategies.

Further, the land price in the core and peri-urban areas is high. Sea reclamation has become a common practice because the unit price of land-making is competitive to the peri-urban's price. For Singapore, land reclamation is required as the city-state needs to accommodate its urban growth. In Jakarta, it also allows new property developments in the reclaimed area to share funding for coastal defence infrastructure development. However, in Jakarta and other major coastal cities in Indonesia, the

impact of the reclamation project is still debated among policymakers. How to balance economic opportunity, spatial justice, and biodiversity protection in the coastal area is an intricate task for the country's policymaking.

Scientific data shows that sea level rise is varied across Southeast Asian megacities. The annual sea level rise for Jakarta, Manila and Singapore is, respectively, 4.3mm, 4.0mm, and 1.0-6.0mm. While such yearly figures may not seem unduly threatening, they would result in a 20-30cm accumulative increase in sea level over the next 50 years, and would thus have a critical impact on the infrastructure of these cities.

Apart from sea level rise, land subsidence – the sudden or gradual sinking of land – is one of the non-climatic factors that exacerbate coastal risks such as seawater infiltration and water pollution. Jakarta, Manila, Ho Chi Minh City, and Bangkok have experienced land subsidence due to excessive groundwater extraction. Numerous studies have shown that the annual rate of land subsidence in some of these cities is precarious. A study titled “The ‘Wickedness’ of Governing Land Subsidence” on upcoming *Water Alternatives* journal this year informs that land subsidence has reached up to 170mm per year in Manila, 85mm in the northern part of Jakarta, and 10mm in Singapore.

As a result of sea level rise and land subsidence, flooding hits Southeast Asian cities more frequently. An article titled “Future Flood Losses in Major Coastal Cities” in the *Nature Climate Change* journal predicts that by adding



Flooding in Jakarta, Indonesia in 2018

Ares Jonckson@Shutterstock



Locals travel through flooded streets in Bangkok, Thailand in 2011

climate change and land subsidence factors, the potential global losses due to floods may increase to US\$53 billion by 2050, compared to only US\$6 billion in 2005. High losses possibly occur because these coastal cities are home to 13% of the world's population with properties and vital infrastructure and utilities.

For instance, the severe flooding in Bangkok during the 2011 monsoon season almost paralysed the whole country's economic activities since Bangkok accounts for 41% of Thailand's GDP. Meanwhile, the 2013 Jakarta flood inundated 75% of the city's territory, forcing the evacuation of more than 83,000 inhabitants. More recently, BBC Indonesia reported that the Jakarta flood in early January 2020 killed 16 people, displaced 32,000 people, and incurred an estimated financial loss of up to IDR10 trillion (US\$665 million). Economics aside, there is a growing concern about the severe impact on low-income groups in urban areas. UN-Habitat reported that in 2013, 28% of global slum-dwellers lived in Southeast Asia. They are hit the hardest by climate uncertainties because of their weak financial safety net, limited access to necessary infrastructure and utilities, and precarious living conditions, mostly non-permanent type of dwellings.

Given the fact that sea level rise is compounded by land subsidence, rapid urbanisation, economic growth pressure, and the more severe impact on low-income population, Southeast Asian cities must find comprehensive solutions to adapt to climate change. There will be no silver bullet strategy since the impact and the capacity to adapt vary across the localities. They should instead form an incremental adaptation or 'transformative adaptation' strategy, which aims to efficiently utilise the available resources while persistently building up commitment among government agencies, non-governmental entities and the private sector to adapt to climate change.

These stakeholders must synergise their approaches to provide an enabling environment for collaborative actions that incorporate social justice in the climate adaptation strategies. For example, measures such as building

sea-walls and establishing stricter building codes must not disrupt the existing community's social systems or the livelihood of the urban poor. This transformative adaptation strategy also allows for adaptation strategies in place today to be modified in the future.

So, in building coastal defence, Southeast Asian cities should not only focus on immediate engineering responses but also create a supportive institution for collaboration. Based on the scientific indicators of sea level rise and land subsidence, especially for the worst scenario of the inundation level, the partnership among multi-level government agencies and cities within the metropolitan region should ensure a certain degree of local autonomy to take deliberate actions. The presence of urban poor and the specific needs of informal settlements should be incorporated in the planning process. Business entities should also be incentivised to take part, which will open up many collaborative opportunities.

Avoiding huge losses and damages due to climate change can only be realised through a systemic approach. A network of transformative adaptation should be established to promote exchange of best practices and cooperation among cities that are vulnerable to climate uncertainties. The ASEAN Smart Cities Network could also serve as a platform for this purpose, and thus contribute to the vision of an ASEAN Community. To explore further opportunities for collaboration, the urban planning professional organisations across ASEAN member states should take a step ahead in discussing the future urban systems of ASEAN megacities for transformative adaptation to climate change. The urban flood issue can be a common and critical topic to start with. 🌊

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The Challenge of Ocean Acidification in Southeast Asia

Albert Salamanca examines ocean acidification in Southeast Asia and offers ideas on how to reduce vulnerabilities and enhance adaptation and resilience to this problem.

The State of Southeast Asia: 2020 Survey Report by ISEAS – Yusof Ishak Institute highlighted climate change as one of the top three security challenges facing the region, above terrorism and increased military tensions from flashpoints. It is a “serious and immediate threat to the wellbeing” of ASEAN member states, the survey says. Yet, one of the climate change impacts that has received limited attention and action in the region is ocean acidification.

As the Earth gets warmer, the global oceans have increasingly absorbed more than 90% of the excess heat in the climate system, particularly since 1970. This has led to the acidification of oceans, which is expected to continue unabated. Ocean acidification has been well documented, especially through the recent Oceans and Cryosphere report by the Intergovernmental Panel on Climate Change (IPCC). Southeast Asia should pay due attention to this threat, as it hosts long coastlines, large coastal populations, extremely diverse marine environment, and economies dependent on coastal and ocean resources especially on marine tourism. The region is also considered a global centre of marine biodiversity, being home to many species of coral reef, fish, algae, mangrove, seagrass, and sea turtle in an area called the Coral Triangle.

The high concentration of atmospheric CO₂ is overwhelming carbon sinks such as forests and oceans. When CO₂ dissolves in the ocean, carbonic acid is

produced, which then reacts with carbonate ions in the water, forming bicarbonate ion and releasing hydrogen ions. The increasing concentration of hydrogen ions disrupts the acid-base balance of the ocean, making it more acidic. Meanwhile, the increasing hydrogen ions bind with carbonate ions, thereby removing carbonates for other organisms that need this element. A decrease in carbonate, for instance, affects the formation of shell and other hard parts of marine organisms. The growth of marine calcifiers such as molluscs, crustaceans and reef-forming corals is affected, potentially undermining the future food security, livelihoods, and economies of coastal communities. Carbonic acid production in oceans from the dissolution of anthropogenic CO₂ has been increasing over the last 150 years, according to studies.

In general, ocean acidification will affect different land and marine species differently, with some being more susceptible than others, depending on their level of sensitivity to changes in ocean chemistry. Its direct effects include changes in the morphology, ecology and behaviour of the species. Its indirect effects could include changes in the movement of carbon, nutrients and energy (trophic dynamics). A 2012 study showed that the global costs to the mollusc fishery due to ocean acidification is over US\$100 billion if the business-as-usual emission trend continues towards 2100. Many more impacts are reported in numerous studies, and an important aspect to consider is that ocean acidification is irreversible.



Hitoshi Namura@Unsplash

Coral reefs in Sumilon Island, a Marine Protected Area in the Philippines



Undertaking a carbon stock assessment of mangroves in West Kalimantan, Indonesia

Kate Evans, CIFOR

In Southeast Asia, research and baseline information on ocean acidification and its impacts have only begun to be collected and published around 2018. But knowledge of acidification on ocean ecosystems and organisms in other parts of the world helps deduce what might happen to the region if we fail to act meaningfully and urgently. Work is beginning to collect more detailed information and set up monitoring sites. One example is the project “Monitoring the Ecological Impacts of Ocean Acidification on Coral Reef Ecosystems”, a part of the Global Ocean Acidification Observing Network (GOA-ON). It provides capability building on acidification research, development of Standard Operating/Monitoring Procedures (SOPs), and setting up monitoring sites in Thailand and Vietnam. GOA-ON is also building a community of practice on ocean acidification with international capacity building workshops held in early 2019 in South and Southeast Asia.

Due to the absence of detailed information, and consequently the inadequate appreciation of the enormity of the problem, ASEAN countries are yet to introduce proactive policies and programs. ASEAN urgently needs to act on its commitment under Goal 14 – Life Under Water – of the UN Sustainable Development Goals (SDGs). Target 14.3 of Goal 14 specifies that member countries need to “minimise and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels”. This means that by 2030, the target indicator for “average marine acidity (pH)” should demonstrably show a reduction over a period of time. However, the Asia and the Pacific SDG Progress Report 2019 shows that there is no progress to date on this indicator. Actions need to be crafted urgently to ensure that this target is met. For a start, efforts towards setting up baselines and national and regional monitoring programmes should be scaled up across the region. Thailand has started its monitoring program since 2016. Some efforts are being undertaken in Indonesia, the Philippines, Vietnam, and Malaysia, but no research has been done so far in Myanmar and Cambodia.

Oceans do not follow national boundaries. The ecosystems and organisms they host are connected and interdependent. For example, the marine turtle hatchlings in Malaysia grow and mature in the Philippine and Indonesian waters before returning back to where they were born. The ASEAN Working Group on Climate Change needs to tackle this issue as a cross-border, transnational issue under its portfolio. As a coastal nation hosting one of the region’s longest coastlines, Vietnam’s ASEAN chairmanship this year could help initiate meaningful actions on this problem.

Thoughtful and transformative adaptation actions need to be crafted since acidifying oceans bring serious impacts to the livelihoods of coastal communities and economies. National adaptation plans (NAPs) need to include actions on how to address acidification, and nationally determined contributions (NDCs) need to articulate achievable targets and follow-up actions. Preparations for the Global Stocktake in 2023 of the implementation of the Paris Agreement is an opportunity to review actions on adaptation as parties are required to provide updates on their NDCs.

Finally, the challenge of ocean acidification needs to be understood and responded to holistically. Actions to reduce greenhouse gas emissions through keeping fossil fuels on the ground and transitioning to more renewable energy sources are required alongside enhancing the adaptive capacities in climate-risk countries. ASEAN needs to take steps to build the resilience of coastal populations and reduce their vulnerabilities to the impacts of acidification. Ocean acidification should also be tackled as part of the region’s action on other problems of coastal and ocean ecosystems such as sea level rise, changing land uses along coastal areas, and marine plastic pollution. 📌

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ASEAN Food Security Amid Climate Change

Paul Teng highlights the imperative to sustain agriculture and productive natural resource base as Southeast Asia braces itself for climate change impacts.



Rice crops drying up during a drought

Food security and agriculture in Southeast Asia are inextricably linked. And yet agricultural production in the region is highly vulnerable to disruptions caused by natural disasters, many of which are linked to climate change phenomena. To sustain food security in the era of climate change, agriculture production must adapt to the natural resource base of land and water.

According to the UN Food and Agriculture Organisation (FAO), “food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active life.” This means that food security includes having available food, being able to physically access that food, being able to afford its purchase, and being assured that the food is safe for consumption. This is markedly different from the 1960s when the challenge was on producing enough to stave off famines. Today, Southeast Asian consumers, especially its growing urban middle class, demand not just enough food, but a diverse mix of high-quality, nutritious, and safe food.

Each ASEAN country strives for its own level of food self-production and sufficiency, except for Singapore and Brunei which rely mainly on food imports. Using a comprehensive data set that covers food availability, food affordability, food quality and safety, the 2019 Global Food Security Index (GFSI) by the Economist Intelligence Unit, UK, shows an improvement in food security for the middle-income and high lower-income countries in ASEAN such as Malaysia (28), Thailand (52),

Vietnam (54), Indonesia (62), and the Philippines (64). Myanmar (77), Cambodia (90), and Laos (92) lagged behind while Singapore retained its premier position as the world’s most food secure country despite its heavy dependence on imports. However the research also notes that countries with high dependency on imports are also most vulnerable to supply disruptions from climate change-linked factors that affect production and distribution.

Rural agriculture is still the most important source of food in Southeast Asia. However, agriculture’s contribution to the economies in ASEAN countries started to decline over a decade ago. In 2018, it ranged from 0% of Singapore’s GDP to 23.5% of Cambodia’s GDP. Agriculture is also an important source of rural employment and food commodity exports. According to the Asian Development Bank (ADB), in the lower-income countries like Myanmar and Cambodia, agriculture contributes, respectively, 48% and 64% to overall employment, with even higher percentages in rural areas.

A matter of concern to agriculture in the region is the shrinking availability of arable land and fresh water resources, with relatively low arable land per capita ratios, ranging from 0.8% in Singapore to 33% in Thailand. Overall, it is declining in all ASEAN countries due to increasing demands for residential and industrialisation purposes, and in some cases due to land degradation from human-induced or natural factors. Agriculture is also the biggest consumer of fresh water worldwide, and

in Southeast Asia there has been competition for water among different sectors of the economy. As Southeast Asia already has one of the lowest per capita arable land ratios in the world (about 0.12 hectare per capita), any further decline such as that caused by climate change would put further pressure on the region's food security.

To their credit, farmers have made Southeast Asia a net exporter of important crops such as rice and cassava. The region is also among the top three world producers of vegetable oils, beans and pulses, fruits, vegetables, chicken and seafood. Despite this success, over 100 million smallholder farmers in ASEAN remain generally poor as most do not engage in value-adding activities. Governments face the challenge to improve their livelihoods in the midst of an ageing farming population and rural-to-urban migration. The discourse on agriculture in ASEAN therefore needs to focus on how to sustain agriculture in the countryside as a viable economic activity rather than on what constitutes "sustainable agriculture".

It is not possible to discuss ASEAN food security without mentioning rice, the main staple for the region. Thailand, Vietnam, and Myanmar are among the world's top rice exporters but Indonesia and the Philippines are among the world's top rice importers. Rice land is decreasing due to other land-use demands, rising sea levels, and salt water intrusion while rice demand keeps increasing from population growth and rice farmers are declining and ageing. Governments will need to find ways to nurture this important agricultural sector. If climate change continues unabated, the ADB projected rice yields to decline 14-26% by 2050, with the accompanying price increase of 29-37%, causing severe impact on the lower-income groups in ASEAN and contributing to even more malnutrition.

Climate change, whether in the longer-term trends, or the already increased frequency of weather-related phenomena, affects food security by affecting agriculture and its supply chain. Southeast Asia has one of the highest frequencies of unexpected severe weather events such as typhoons, which affect the Philippines and Vietnam annually. Likewise, changes in seasonal weather patterns such as delays in the onset of monsoon rains or reduced rainfalls leading to drought conditions cause annual havoc on agriculture. The Index of Climate Vulnerability by the Consultative Group for International Agriculture Research (CGIAR) shows the Philippines, Indonesia and Cambodia at extremely high vulnerability, and parts of Vietnam, Malaysia, Thailand and Laos at moderate vulnerability. The Intergovernmental Panel on Climate Change (IPCC) also highlights the communities along coastal and delta regions at risk of being flooded due to sea level rise, especially the Lower Mekong River Basin (LMB), which produces half of the world's exported rice supply, and the Ayerwaddy delta in Myanmar.

There are ASEAN mechanisms for collaboration on food, agriculture and climate change, including the ASEAN Vision and Strategic Plan for Cooperation in Food, Agriculture and Forestry 2016-2025. Another



Maize plants affected by drought at the Thai Department of Agriculture's Nakhon Sawan Field Crops Research Center

Eloise Phipps, CIMMYT

concrete example is the ASEAN Plus Three Emergency Rice Reserve (APTERR) which allows for ASEAN members together with China, Japan and South Korea to take joint action on food emergency. Likewise, the ASEAN Working Group on Climate Change (AGWCC) is responsible for implementing cooperation activities under the ASEAN Climate Change Initiative (ACCI). The multi-sector approach is employed in the development and implementation of the ASEAN Multi-Sectoral Framework on Climate Change: Agriculture, Fisheries and Forestry towards Food Security (AFCC).

Most Southeast Asian economies still rely on agriculture for employment and natural resources for livelihood and well-being despite the declining share of agriculture in their GDP. It is expected that the region will continue to be impacted by adverse effects of climate change. Because climate change is not a geographically-isolated phenomenon, regional efforts need to be strongly supported at the ASEAN level, on top of national programmes, to deal with localised impact on agriculture and food security. In this regard, projects such as the GIZ Climate Smart Land Use in Jakarta, and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in Hanoi, offer hope that regional efforts can give results which complement country-level activities. 🌱

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Leveraging the ASEAN Smart Cities Network for Climate Resilience

Melinda Martinus suggests that the ASCN offers a new way for ASEAN climate action to be felt locally.



In the era of climate change and rapid urbanisation, it is imperative to encourage and enable local governments to exercise proactive measures towards sustainability. Not only do local governments possess an intimate knowledge and understanding of their localities with all the constraints and potentials, but they are also the most accountable institution to their communities. To leverage this enriching pool of local governance, the ASEAN Smart Cities Network (ASCN) was established in 2018 as a platform for cities across the region to collaborate, share knowledge, and build bankable projects to address urban problems specific to each city's needs, potentials, and local contexts.

The ASCN is a new and innovative approach to regional cooperation since it started as a regional platform but its action and impact are meant to be felt locally. Traditionally, ASEAN's work on environment-related issues such as transboundary haze pollution control and renewable energy transition has been carried out at the intergovernmental level under the purview of the relevant ASEAN sectoral ministerial bodies. The ASCN is meanwhile a platform for regional, state, and local stakeholders, with the local government as the engine to initiate and implement project proposals.

It is estimated that there will be an additional 70 million population to live across Southeast Asian cities by 2025. While urbanisation could overburden infrastructure, and put immense pressure on cities to provide adequate

housing and public facilities, there are plenty of opportunities to be tapped. New technologies such as machine learning, artificial intelligence, open data and renewable energy, coupled with expanding internet penetration in the region, are providing ample accessibility for local governments in the region to mobilise support for their urban solutions.

ASEAN projects are mainly implemented through government-to-government channels, but the ASCN adopts a different approach to build partnership. The 26 pilot cities and their national representatives to the ASCN work together to outline the scope of work and the expected outcome of their smart city projects. The ASEAN Secretariat facilitates pairing up with solution partners or business entities for implementation. So far, it has successfully attracted regional and international solution partners from the US, Japan, Australia, the Republic of Korea, and China to provide support for infrastructure improvement, technology adaptation, and capacity building under the ASCN.

Most ASCN pilot cities develop proposals for infrastructure and public services improvement but some of them also target climate change adaptation and environmental protection. For example, the three cities of Chonburi (Thailand), Johor Bahru (Malaysia) and Luang Prabang (Laos) are seeking to forge partnerships with technology solution providers to address climate change issues, with the support of the ASCN.

Chonburi

Being one of Thailand's largest industrial cities has inspired Chonburi to adapt to smart and sustainable industrial practices. Over the past few years, Amata City Chonburi Industrial Estate has been a supportive partner to the Thai government in driving economic growth in the region, hosting more than 1,000 factories with 200,000 jobs, and contributing US\$40 billion annually to Thailand's GDP. In response to the Thai government's Industrial 4.0 program, Amata City is shifting its focus to innovation and sustainable industrial technology. While smart manufacturing technology such as integrating location and streamlining production activities will be the main focus of future development, a commitment to lessen the impact of the environment hazards such as renewable energy adoption and waste management will also be emphasised.

Through the ASCN, the Amata City Chonburi has teamed up with the City of Yokohama, a world-leading smart industrial city, to conduct a feasibility study on smart and integrated industrial city. The collaboration will focus on assisting Amanta City Chonburi to utilise renewable energy, energy-efficient infrastructure, and smart waste management system. Amata City Chonburi expects to see these strategies to improve efficiency, competitiveness and liveability, while continue providing cutting-edge manufacturing services for substantial growth in the country.

Johor Bahru

By 2030, there will be an additional one million population that will occupy the city of Johor Bahru. Rapid population growth and the heightened risk of droughts driven by climate uncertainties will put urban water resources on the brink of scarcity. Many studies point out that the city's water reserve could only meet 8% of the water demand. The water reserve is also projected to decline by 5% in 2020 under business as usual circumstances. Therefore, Johor Bahru targets to implement the integrated urban water management blueprint to improve water sustainable practices so that the water reserve will be increased by 20%.

A set of multi-strategies from water recycling, harvesting, desalination, and wetland restoration is being initiated to improve water supply in the city. To integrate these approaches, the city needs to adopt smart water management systems such as real-time data management, forecasting software, and monitoring schemes. Through the ASCN, the city of Johor Bahru is seeking support for technical advisory to build a comprehensive framework on water governance.

Luang Prabang

Over the past few years, Luang Prabang has witnessed tremendous change brought about by rapid tourism development. While tourism plays an essential role in generating employment and reducing poverty in

the city, it has also presented greater environmental pressure on this UNESCO World Heritage Site. Widely known for its outstanding traditional architecture situated in the splendid landscape of the Mekong River, the city of Luang Prabang is formulating strategies to manage tourism development without compromising heritage and environment.

The ASCN is helping Luang Prabang to develop a proposal to realise a world heritage site with clean, green, and liveable environment by 2025. A series of strategic targets such as smart waste management, green spaces restoration along Mekong and Namkan River, and sustainable tourism practices by business owners, will be the core of Luang Prabang smart city planning.

The future ASEAN action on climate change relies on collaborative efforts between facilitation from regional mechanisms and central governments, initiatives from localities, and technical advisory and technology solutions from the private sector. The ASCN follows this approach, offering a new platform to deepen commitment and cascade impacts at the local level. It encourages the local government to participate actively in regional cooperation to improve living quality while tapping ample economic opportunities for sustainable growth. The ASCN focuses on scalable solutions at the city level, people-oriented approach, and collaboration across different sectors, while still embracing the regional value of sharing and caring. Although the ASCN is just in its beginning stages, it holds the potential to help Southeast Asia to be more climate-resilient, and to bring ASEAN closer to the people. 🌱

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Johor Bahru, one of the 26 ASCN Pilot Cities

Sam Gao@Flickr

Climate Change in Southeast Asia

Climate Risk Index (CRI) 2018⁽¹⁾

	Philippines	Vietnam	Laos	Cambodia	Myanmar	Indonesia	Thailand	Malaysia	Brunei	Singapore
CRI Rankings / Country	2	16	22	38	48	64	67	97	135	135
CRI Score	11.17	26.17	35.5	47.67	53.83	68.17	68.83	84.83	125	125
Fatalities Per 100,000 Inhabitants Rankings	14	33	8	17	43	74	59	61	115	115
Absolute Losses (Million US\$ PPP) Rankings	7	18	69	79	59	42	60	96	135	135
Losses Per Unit GDP in %Rankings	14	32	51	72	79	104	105	123	135	135

Most Affected Countries by Climate Change in 1999-2018⁽¹⁾

Long-term CRI Ranking	Country	CRI Score	Death Toll	Deaths Per 100,000 Inhabitants	Total Losses (Million US\$ PPP)	Losses Per Unit GDP (%)	Total Number of Events
2	Myanmar	10.33	7052.40	14.29	1630.06	0.83	55
4	Philippines	17.67	869.80	0.96	3118.68	0.57	317
6	Vietnam	29.83	285.80	0.33	2018.77	0.47	226
8	Thailand	31.00	140.00	0.21	7764.06	0.87	147



Resolving deforestation could generate more than half of regional climate change mitigation through the mid-2030s.⁽⁵⁾



The region's **GHG emissions** are estimated to be at least **60%** higher in 2050 than that of 2010.⁽⁵⁾

Deforestation accounts for almost **half of Indonesia's emissions**.⁽⁵⁾

Annual growth rate of greenhouse gas (GHG) emissions in Southeast Asia.⁽⁵⁾ **5%**



In terms of agricultural output and adaptive capacity factors, **Cambodia** and **Vietnam** are considered among the **world's most vulnerable countries** to climate change.⁽⁴⁾



The Coral Triangle's food provision capacity for coastal communities is projected to be halved by 2050.⁽³⁾



US\$57.98 billion

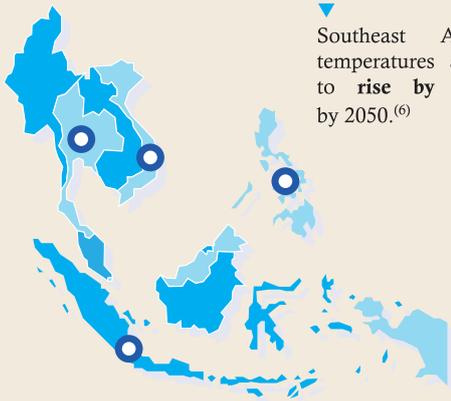
The cumulative loss in value of **reef-related fisheries** in Southeast Asia for 2000-2050 is estimated at around US\$57.98 billion.⁽³⁾



Due to climate change, rice yield in the Mekong River Delta is projected to decline by 6%–12%, and yields of other crops by 3%–26% until 2050.⁽³⁾



Rice yields could decline due to climate change by up to **50% by 2100** in Indonesia, the Philippines, Thailand, and Vietnam.⁽³⁾

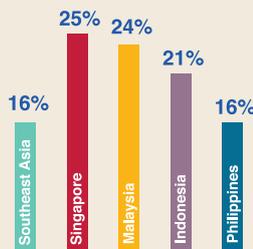


▼ Southeast Asia's mean temperatures are estimated to rise by up to 2°C by 2050.⁽⁶⁾

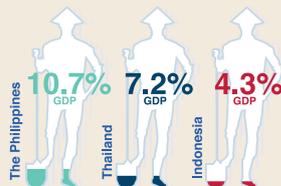
▼ Climate change will cause 4.8°C rise in mean annual temperatures by 2100 in Indonesia, the Philippines, Thailand and Vietnam.⁽⁷⁾

▼ Mean temperatures in Southeast Asia have increased at a rate of 0.14°C–0.20°C per decade since the 1960s.⁽⁵⁾

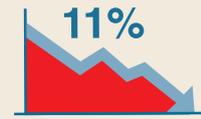
The loss in labour capacity due to heat stress by 2045 is projected to decrease by⁽⁶⁾:



Reduced worker productivity in agricultural sector due to heat stress is projected to take a toll on the economy⁽⁶⁾:



According to the World Health Organisation's projections, climate change in Southeast Asia by the 2030 will cause up to⁽³⁾:



800 additional diarrheal deaths annually among children under 15 years

If no action is taken to address climate change, Southeast Asia may lose up to 11% of its GDP by 2100.⁽⁵⁾



500 additional malaria-related deaths annually



The estimated cost of relocating Indonesia's capital from Jakarta to East Borneo is US\$33 billion.⁽¹¹⁾



2,400 additional deaths annually among people above 65 years due to more warm and hot days.

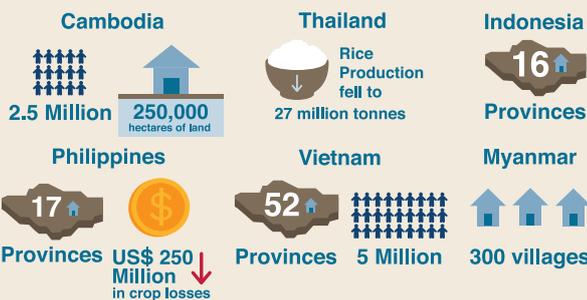


Climate change is estimated to reduce Vietnam's national income by up to 3.5% by 2050.⁽¹²⁾



Typhoon Mangkhut, the most powerful typhoon recorded worldwide in 2018, affected more than 250,000 people in the Philippines and claimed 59 lives.⁽⁸⁾

El Niño-induced drought crises in 2015-2016 affected⁽¹³⁾:



5.9 Million

Three of the top 20 cities with the largest growth of annual flood losses from 2005-2050 are in Southeast Asia.⁽³⁾



Indonesia will be the most affected country in the region by coastal flooding with 5.9 million people affected every year until 2100.⁽³⁾



Nearly 1% of land and capital stock, most likely in key low-lying coastal cities, such as Bangkok, Jakarta, Manila, and Ho Chi Minh City, could be lost by 2050 due to the effects of sea level rise.⁽⁵⁾



Climate change will cause 70cm rise in mean sea levels by 2100 in Indonesia, the Philippines, Thailand and Vietnam.⁽⁷⁾

Jakarta is one of the world's fastest-sinking cities with land subsidence of up to 17cm (6.7 inches) per year. By 2050, 95% of North Jakarta is projected to be underwater.⁽¹⁰⁾



Sources:

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- 3) A Region at Risk: The Human Dimensions of Climate Change in Asia and the Pacific, ADB 2017
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Climate Change Action Through Landscape Design

Kotchakorn Voraakhom shares her experience of designing her hometown Bangkok with climate change action in mind, and explores further collaborations in Southeast Asia.



Ms. Kotchakorn Voraakhom is a landscape architect and founder of The Porous City Network, an architectural social enterprise to increase urban resilience in Southeast Asia. She earned her Bachelor's and Master's degrees in landscape architecture from, respectively, Chulalongkorn University and Harvard University, and has since been a fellow at various institutions such as TED, the Asia Foundation, and Echoing Green. She was featured in TIME Magazine's 15 Women Leading the Fight Against Climate Change for being an ardent and impactful campaigner for public green spaces in urban settings.

AF: Landscape architecture is generally regarded as an unconventional career path for women in this region. What attracted you to this field?

KOTCHAKORN VORAAKHOM: Imagine your home is in danger. You would do whatever you can to save it. My home, Bangkok, is one of the most vulnerable cities in the world, sinking two centimeters every year. As a designer, I feel an immense responsibility to do whatever I can to bring environmental and growth balance in my city. Being a landscape architect provides an incredible opportunity to make a difference, proposing real action to adapt better to climate change. This makes me proud to be a Thai landscape architect working and trying to fix this problem.

AF: You are renowned for blending aesthetics with functionality to deal with climate change. What inspired you to champion action on climate change?

KOTCHAKORN VORAAKHOM: Bangkok is situated on the floodplains. However, the city is sprawling, and the water reserve has been excessively exploited for

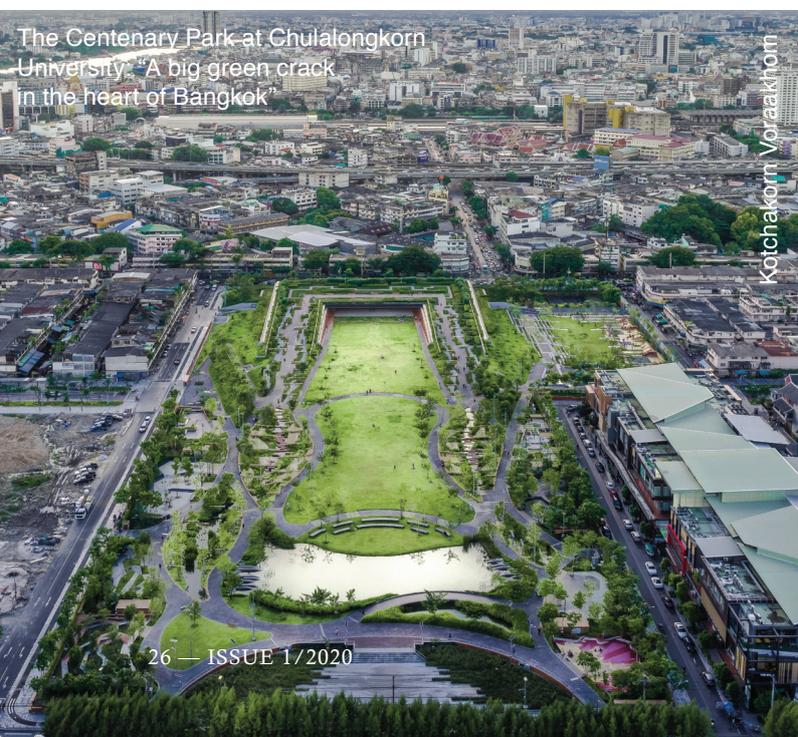
decades. Rapid urbanisation growth has ignored the city's porous delta landscape, consuming natural waterways and agricultural land that once absorbed water. Bangkok, known as Venice of the East, no longer adapts to water as it used to. The entire city can flood within 30 minutes of rainfall. I feel obligated to help regenerate Bangkok's landscape. And I believe landscape design, through its aesthetic and function, is one of the powerful tools to increase our city resilience and cope with future uncertainty.

AF: The Centenary Park at Chulalongkorn University (CU) is widely acclaimed as a "big green crack at the heart of Bangkok's concrete jungle". As its chief architect, could you explain how it is designed with climate change action in mind?

KOTCHAKORN VORAAKHOM: The CU Centenary Park is a nature-based landscape architecture solution that re-defines the role of public green space in Bangkok. CU Centenary Park ventures beyond recreation and beautification to mitigate water, air, and heat issues. Its landscape mechanisms form a comprehensive water management system. Its greenery reduces urban heat islands by reflecting sunlight and cooling the atmosphere while cleaning the air of toxic pollutants. The CU Centenary Park sets a model for the regeneration of green infrastructure in Bangkok and mitigates urban flood in other sinking cities in the region. Amidst rapid urban development, this park shows how public space does not only beautify the city but can be an integral part of the solution to the climate crisis.

AF: You are completing an even more ambitious project at Thammasat University (TU). What does this new masterpiece mean to you?

KOTCHAKORN VORAAKHOM: As a new landscape design in one of Thailand's leading public universities, the TU Rooftop is aspired to be the biggest urban farming rooftop in Asia. In building such a project, it



The Centenary Park at Chulalongkorn University: "A big green crack in the heart of Bangkok"

Kotchakorn Voraakhom

has involved various stakeholders. Local authorities, citizen groups, and private sectors, as well as students and faculty, have been instrumental in the creation and ongoing maintenance of the project. TU Green Roof has genuinely become a green public space made for the people and maintained by the people. The community educates all on how traditional rice terrace farming methods can be adapted for innovative climate mitigation today. The design also incorporates sustainable agriculture and food security practice, on-site water management, public space, and solar panels to mitigate the effects of floods, droughts, decreasing agricultural yields, and heatwaves. Instead of only building a wasted rooftop that contributes more to urban heat, TU Green Roof is a way to form an integrative design and build a climate-conscious community.

AF: Could you tell us about the Porous City Network (PCN) in Bangkok?

KOTCHAKORN VORAAKHOM: After completing several projects, I realised that working on client-based projects is not enough to make a substantial impact. We need to advocate climate justice and offer our expertise to those in need. In most projects, we only provide design solutions for those who hire us, yet the impacts of the projects are more than that. In reality, those who are poor, vulnerable, and affected by climate change need our help the most. The PCN's goal is to not only help the vulnerable but also educate the younger generations. Being 'porous' is not just water-related; it also means inclusivity and collaborative nature of a community. Bangkok used to be 'porous', porous to water, porous to air, and porous as a society. Now our city is built of concrete, and we are segregated. Porosity is an environmental and lifestyle solution. It reminds us that the Bangkok community is connected, resilient, and adaptive.

AF: What is the most challenging part in the implementation of the PCN project?

KOTCHAKORN VORAAKHOM: This is a new approach, and the problems we are facing are more complex. The greatest challenge is creating a middle ground as a win-win situation between those in power and the vulnerable. We use education as a tool to bridge the gap between our divided communities. It is crucial to find both economic and sustainable solutions for the communities in need.

AF: Are there any lessons-learned or best practices for other ASEAN cities from the PCN project?

KOTCHAKORN VORAAKHOM: In our work, we are making an effort to take the benefit of the way we used to live with water in the varying seasons, and combine them with innovative technology. With these strategies, we form a sustainable design solution that brings a better and healthier future for all. Big cities like Jakarta, Penang, and Bangkok are situated on floodplains, with their urban sprawl and water reserves having been exploited for decades. Their rapid growth ignores the porous delta landscape, consuming natural waterways and agricultural



Kotchakorn Voraakhom giving a TED talk on designing the Centenary Park at Chulalongkorn University

Ryan Lash, TED

land that once absorbed water. As a collective society, we should explore those issues and forge a solution. We are excited to collaborate with the urban communities in Malaysia and Indonesia.

AF: What are your suggestions to make ASEAN cities more sustainable and resilient to climate change?

KOTCHAKORN VORAAKHOM: First, we must acknowledge the causes and effects of climate change in our cities. Flooding, rising sea levels, and droughts are affecting our livelihoods. Second, we must realise that environmental problems do not discriminate. A problem in Jakarta or Penang is a problem for us in the region. Just as the air pollution from forest burning in Indonesia has affected communities in Singapore and Malaysia, sea level rise would affect all of our coastal cities without exception. Therefore, it is paramount that we build a dialogue on our common problems and act together as a region.

AF: As a platform for regional cooperation, what can ASEAN do to advance projects on climate resilience in the region?

KOTCHAKORN VORAAKHOM: ASEAN is a unique organisation that promotes collaboration and cooperation among its member states and the advancement of the interests of the region as a whole, including economic growth and trade inclusivity. Even though we are a small group, we are incredibly diverse. But this is our strength. As climate change brings devastating consequences, ASEAN has been proactive on this front. Further, both ASEAN and urban communities should work together to complement each other across different scales. Rather than providing further training off-site, ASEAN should look into practical situations, taking immediate action to help people in need and make its impact felt.

AF: ASEAN has rolled out the ASEAN Smart Cities Network (ASCN) to promote smart and sustainable urban development in the region. Do you have any suggestions for this network to be impactful?

KOTCHAKORN VORAAKHOM: We have to be conscious of how we define “smart”. People often associate “smart” with technology, the internet, and the future. If we adopt this concept, then we will consume even more and be addicted to growth. This is not the “smart” concept we want. We want a smart city with ethical and intelligent people. We live in an era where people are continually looking for an ‘upgrade’ or new object. I consider “smart” to be using the tools we already have to form innovative design solutions that include heart, not only head. This ensures our “smart” solutions are adaptable, affordable, and most importantly, accessible to everyone. The ASCN already lays out six priority sectors to work with. But, I see that there are a lot of opportunities within the environment sector, such as reducing carbon emission and circular economy. In general, protecting our natural resources should be the top priority of the smart city network.

AF: Congratulations on being one of the TIME Magazine’s 15 Women Leading the Fight Against Climate Change. What does this well-deserved recognition mean to you?

KOTCHAKORN VORAAKHOM: Thank you very much. This award is a special reminder of what I have achieved so far, but this is just the beginning. This recognition keeps me accountable, and I am determined to continue my practice in landscape architecture and community building. It has provided me with opportunities to build dialogues with people from different backgrounds and expertise, where we can share experiences and knowledge. Hopefully, through these opportunities, we can explore and implement more impactful projects.

AF: What advice do you have for young and energetic ASEAN women who aspire to be the next Khun Kotchakorn?

KOTCHAKORN VORAAKHOM: The younger generations must be not only empowered to fight for their future, but should also be inspired to act for their community. They should have their own voice by



Thammasat University Park is the largest urban rooftop farm in Asia

Kotchakorn Voraakhom

immersing themselves in projects that they are passionate about. They should be proactive and not afraid to speak up. It is essential to empower others who are less fortunate by sharing knowledge and resources, being more generous and a kinder version of oneself.

AF: If you had not ventured into landscape architecture, what profession would you see being in now?

KOTCHAKORN VORAAKHOM: My aspiration comes from my country. I can imagine I’d be something in-between an organic farmer and an environmental conservationist. A large portion of the food we consume today is cultivated in Thailand. However, despite living in such an advanced and civilised society, we are still eating toxic and unhealthy food. I am determined to bring pesticide-free land to the nation.

AF: What is the next big project of your green crusade?

KOTCHAKORN VORAAKHOM: When it comes to my work, I am not concerned about the scale. Instead, I focus on the impact on the livelihood, living quality, and health of the urban citizens. I believe my future projects will highlight the need for a shift towards a more sustainable lifestyle that encourages the wellbeing of the individual and the city. At this moment, we are exploring the opportunity to re-use the under-utilised space and infrastructure in Bangkok. We will focus on activating public spaces and sidewalks so that Bangkok urbanites can enjoy vibrant, safe, and liveable spaces for all. 🌱

Thammasat University Park



Kotchakorn Voraakhom

Ecotourism in Southeast Asia: Cultivating Reciprocity and Sustainability

Glenn Ong dives into the many offerings that Southeast Asia holds for the adventurous yet responsible ecotourist.

The Indonesian island of Bali is best known for its exotic beaches, imposing volcanoes, and terraced rice fields. In recent years, however, the famed resort island is quickly becoming popular for an alternative form of travel that bucks the tide of mass consumerism in favour of conservation, sustenance, local empowerment, and education: ecotourism.

Eschewing regular tourist attractions that might encourage a detached, aloof, and transactional relationship between visitors and locals, ecotourists flock to ecovillages like the Baliwoso Educamp to revel in Balinese dance, play the gamelan, and participate in small-group forest trekking. To learn about the importance of food security and natural resource management, visitors to the Dukuh Sibetan agri-tourism village in Bali can live alongside the residents and participate in the cultivation process of ‘snake fruit’ – or Salak – the only plant in the area that can flourish amid the harsh environs forged in the wake of Mount Agung’s eruptions. In addition, female visitors will be treated to an exclusive peek into the roles and lives of the village women, injecting a crucial but often overlooked gender dimension into the overarching theme of development and upliftment.

While sceptics of ecotourism might lament that such ‘glamping’ or ‘glamour camping’ amounts to little more than consumerism in another guise, ecotourist destinations like Baliwoso and Dukuh Sibetan are just two of the many examples in Southeast Asia that help to sensitise visitors to the reality that travel destinations often have to deal with the ramifications of mass tourism after visitors depart. They also highlight the inherent value of these places and the locals who inhabit them, beyond the mass tourist services they provide, thus adding purpose and meaning to the local experience. Moreover, the motivations of ecotourists to visit alternative destinations, minimise their carbon footprint, and immerse themselves in local cultures constitute meaningful change in itself.

Indeed, Southeast Asia’s staggering diversity is manifest not only in its natural landscapes, but also in its manifold cultural constellations. This makes the region ideal to blaze a path forward as a leader in ecotourism and responsible consumption.



Home stay programme in Bali's-Penglipuran Village

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A riverside guest house in Luang Namtha, Laos

Given the importance of agriculture to the region's environment and economy, no ecotourist trip to Southeast Asia will be complete without visiting the Living Land Rice Farm in Luang Prabang, Laos. Surrounded by majestic hills and lush greenery, visitors learn how locals use organic and traditional farming methods and tools like “crop-rotation, fallow periods and organic composting” to cultivate rice crops while minimising land degradation. Instead of heavy machinery, moreover, visitors can guide the buffaloes as they plough the land, and put their newfound knowledge to productive use by joining hands with local farmers to plant and harvest the rice crops, and thereafter savour the fruits of their labour by feasting on the harvests. Not only will tourists get to immerse themselves in the farmers' work, the educational journey also helps to provide local guides with an additional source of income, which is a direct contribution towards uplifting the community.

Should you prefer to explore the impressive sights that Laos has to offer, the Boat Landing Guest House in Luang Namtha features beautiful riverside bungalows and provides visitors the option to engage in thrilling yet sustainable forms of trekking and rafting in protected parks and rivers. The Boat Landing Guest House, which manages its waste through composting and recycling, is

a certified ecolodge with a seal of approval from Green Globe, an independent company that evaluates enterprises that brand themselves as ecotourist attractions.

Just south of Laos lies another favourite of seasoned ecotourists: the national parks of Thailand. The Khao Yai National Park in Nakhon Ratchasima Province is the kingdom's first national park and its third-largest to date, comprising over 2,000 km² of tropical forests and vast grasslands. With about 50 km of hiking and biking trails, the park provides visitors with a rare opportunity to trek through Thailand's protected forests and soak in the sights of its famed waterfalls. Ecotourists who wish to acquire an in-depth knowledge of Thailand's conservation efforts can also enrol in a 10-day educational programme, where they can gain an insight into regional ecology and learn about the government's efforts to combat poaching and manage logging.

Flora aside, the region also contains an amazing variety of the world's most endangered fauna. In Malaysia's Sukau Rainforest, visitors can learn about turtle conservation efforts as they bunk in solar-powered ecolodges, which in turn channel a portion of their income to fund wildlife conservation programmes. In addition, the 130 million-year-old Taman Negara (or 'national park' in Malay) tropical rainforest, also in Malaysia, is home to the Asian elephant and the Malayan tiger. These animals can be viewed from special hideouts created to minimise human contact. The fragility of the ecosystem is highlighted by the recent extinction of the Sumatran rhinoceros in Malaysia as recently as November 2019. Only 80 Sumatran rhinoceros remain in the world today.

Indeed, whether on land or in the sea, conservationists in the region are hard at work maintaining the delicate balance between protecting endangered wildlife and educating the public about their fragility. Thus, visitors to Donsol, Sorsogon in the Philippines have the chance to view whale sharks and manta rays in their natural habitats, but not before they are educated about the harmful effects of products like sunscreen and the disruption that unregulated sea vessels can have on the marine ecosystem.



Asian Elephants strolling along a road in Khao Yai National Park

tontantravel@Flickr



Khmer Ceramics & Fine Arts Centre in Siem Reap, Cambodia

Ecotourism encompasses more than the natural environment. It includes preserving intangible and cultural elements that are just as valuable as nature is to the local communities. A popular form of cultural ecotourism takes place in Cambodia, which is home to one of the oldest pottery traditions in Southeast Asia, dating back to the third millennium BCE. Today, this cultural heritage is being preserved by social enterprises like the Khmer Ceramics & Fine Arts Centre. Located in Siem Reap, the Centre was established in 2006 as a non-profit entity that aims to create opportunities for the impoverished and help revive the art of Cambodian ceramics. Visitors will be taught by locals on how to fashion their own ceramic bowls from scratch, and then to adorn them with Khmer-inspired designs using traditional carving tools. This two-hour programme allows ecotourists to gain first-hand exposure to Cambodia's rich cultural heritage, contribute to keeping the art of Khmer ceramics alive, and help sustain the livelihoods of local artisans. The process of learning and interacting with the locals also places visitors in a position of empathy, and empowers the local community with the agency and autonomy to shape the way outsiders view and participate in their cultures.

From rice farming to pottery-making, Southeast Asia's rich natural and cultural diversity means that there is an ecotourism activity and destination for any kind of traveller. While the region still faces challenges in ensuring that service providers – especially those in outlying regions – conform to national and international standards, all ASEAN member states have ratified the United Nations Convention on Biological Diversity. ASEAN's commitment to genuine ecotourism, which entails cultivating a reciprocal relationship between the visitor and the local, and between people and the environment, holds out hope that the region will continue to be a leader in efforts to harness the “powerful forces that shape the essence of tourism, including the human urge to see and experience the natural world”, for the preservation of our environment and the betterment of its inhabitants. 🌿

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Two northern pig-tailed macaques rest atop a tree in Khao Yai National Park



An Oriental Pied Hornbill in Khao Yai National Park

Life on the Water: Floating Villages in Southeast Asia

Anuthida Saelaow Qian captures the unique ways of life in floating communes around Southeast Asia and highlights their tenuous relationship to the environment.

Water has always been essential to life. Ancient civilisations have sprung up along the Nile, the Yangtze, the Tigris and Euphrates, and the Indus, which provide vital sources of drinking water, irrigation, protection, transport, and more. In Southeast Asia, major waterways like the Mekong, the Irrawaddy, and the Chao Phraya have shaped not only the landscape but also the destiny and cultural character for millions of people past and present. For certain communities, their daily life is literally permeated with water – in fact they live right on it. Most of these floating village dwellers eke out a living by fishing, aquafarming, and practising other water-based activities, drawing on their knowledge of the natural environment to sustain their livelihoods.

In picturesque Koh Panyee, a fishing village located near Phuket, around 1,800 Thai Muslims of Javanese descent live in a cluster of houses and huts perched on wooden stilts. After docking at the pier, one is greeted by narrow walkways of planks leading into the tight-knit community. You might first enjoy a refreshing meal out of the sweltering heat at a local seafood restaurant, where the catch of the day is as fresh as it gets, before setting off to explore the rest of the village. Amongst the crowd of gift shops and street food stalls, the Panyee Darussalam Mosque stands out with its gleaming golden domes and offers a spiritual glimpse into where the locals gather to pray. Another highlight is the local school set against the crystalline waters of Phang Nga Bay and towering limestone cliffs, which gives a new meaning to the saying that the world is your classroom.

The village is perhaps most well-known for its floating football pitch, built by a group of young boys who were inspired by the 1986 FIFA World Cup. Cobbled together from old wood and fishing rafts, the pitch stands as testament to their determination to not let a lack of space prevent them from enjoying the game. The Panyee Football Club found national fame after its story of grit was broadcast across the country, and is regarded as one of the best youth football teams with seven regional titles. The island's claim to fame saw an exponential growth in tourism and a much-needed boost in local incomes. Although a new concrete pitch was eventually built, the original pitch still stands as a unique photo spot for visitors. Football culture remains deeply ingrained in the village's psyche, with most local youths keeping the torch of Panyee FC burning brightly.

Maintaining and managing the environment it relies on has become a priority for Koh Panyee as its tourism industry grows. Villagers gather regularly to pick up trash accumulated on the shores, and its local school raises funds through the sale of collected bottles and cans under its recycling programme. The school also teaches its students self-sufficiency through hydroponics alongside regular classes, cultivating a community of eco-conscious children.

Off the coasts of Indonesia, Malaysia, and the Philippines, a nomadic seafaring group known as the Bajau (also referred to as *Bajau Laut* or *Sama Dilaut*, amongst other ethnonyms) reside in the middle of the ocean. For most Bajau, home is a stilted bamboo hut rising from the blue waters, but sometimes it is a houseboat known as *lepa-lepa*. For centuries, the Bajau have lived off the sea and raised their offspring on a diet of swimming and fishing. Life is simple on the water – they spend up to six hours underwater on a work day, free-diving and hunting for sea creatures and pearls for their own consumption and for sale. As skilled divers, they are capable of plunging to depths of more than 70 metres armed with no more than handmade spears and wooden goggles. Their bodies have even adapted by developing larger spleens that allow them to hold their breaths for longer periods of time – it is said that the Bajau can perform the superhuman feat of staying underwater for as long as 13 minutes.

Unfortunately, a litany of threats have placed the traditional Bajau way of life in jeopardy. Many have left their *lepa-lepa* in search of work in urban areas. Those who stay at sea have to compete with large commercial



The new concrete football pitch in Koh Panyee's school

fishing fleets, and have taken to using potassium cyanide and dynamite to bring in larger hauls and catch live fish. Although such destructive fishing practices have now been made illegal by most countries for their damaging impact on coral reefs and marine life, these bans are not always strictly enforced and the devastating aftermath is being felt. Overfishing and climate change have also caused fish populations to decline, forcing the Bajau to put their lives at risk by diving deeper and further for a greater catch. Their plight pulls into sharp focus the need to conserve not only the marine resources the Bajau are so dependent on, but their unique cultural heritage as well.

A similar and worrying trend of environmental threats can be seen in Cambodia, where hundreds of floating villages line the watersides of Tonlé Sap. Villages like Kompong Khleang, Kampong Phluk, Chong Kneas, and Mechrey offer glimpses of homes, schools, medical centres, temples, shops, and even cemeteries that bob on the water, all connected by extensive mazes of canals. While cruising down the lake, one might soak up scenes of daily life for these communities: children splashing in the water, vendors peddling their wares from sampans, women washing clothes, and men tending to their fishing nets. They are almost fully dependent on Tonlé Sap and its surrounding fertile soils, catching and rearing freshwater fish and cultivating agriculture for subsistence. During the rainy season in June to November, the Mekong River's mighty coursing reverses Tonlé Sap's flow and causes the lake to swell up to six times its dry season size, flooding the villages and leaving water lapping at the doorsteps of houses raised on stilts as high as 10 metres.

Sadly, villagers have felt the deleterious effects of climate change, dam projects, and overfishing. In 2019, the Mekong recorded its lowest level of water, leaving Tonlé Sap in crisis. Its fishermen report hauling only a meagre 10 to 20% of their usual catch. Additionally, the fates of local villagers rest on uncertain soil. In 2015, Cambodian government officials announced a plan to relocate more than 4,500 families living on Tonlé Sap in order to clean up the lake and restore its ecosystem. At the time of writing, many families remain in limbo due to lacking facilities and infrastructure at their planned relocation site.

The extraordinary stories of grit and perseverance of various floating communes around Southeast Asia bring to light the need to preserve their distinctive cultures and lifestyles as well as the riverine and coastal environments that are at the heart of their identity and existence. Living with water is a natural way of life for these floating villages and many other communities in Southeast Asia. But the nurturing and life-giving capacity of the region's waterscapes is staggering under the burden of people's expanding ecological footprint. As one of the most at-risk regions to climate change and natural disasters, Southeast Asia has to adapt to the rising tides of oceans and erratic flows of its rivers, starting from learning to respect our waters again. 🌊

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Bajau Laut in Sabah, Malaysia

Fabio Achilli@Flickr



Children in Kampong Ayer, a floating village in Brunei Darussalam

Enrico Bargnani@Shutterstock



Kompong Phluk floating village on Cambodia's Tonlé Sap

Brian Hoffman@Flickr

Omar Ali Saifuddien Mosque

Brunei Darussalam

The Omar Ali Saifuddien Mosque is located in the heart of Bandar Seri Begawan and bears the namesake of the 28th Sultan of Brunei. Perched on the banks of the Brunei River, the mosque is surrounded by a man-made lagoon which also bears a replica of a 16th-century royal barge. Designed by architect Rudolfo Nolli, the mosque incorporates a blend of Italian, Mughal, and Islamic architectural styles. It features a gold dome covered in gold leaf and glass mosaic tiles as well as a 52-metre-tall marble minaret. The mosque is equally opulent on the inside, with Italian marble pillars and floors, English crystal chandeliers, and carpets from Saudi Arabia. Since its completion in 1958, the mosque has been recognised as a symbol of the central role of Islam in Brunei.

(Source: Brunei Tourism Board)

