

# Impact of Climate Change on ASEAN International Affairs

Risk and Opportunity Multiplier



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The content of this study benefits from the collective Southeast Asian foreign-policy expertise and experience of its authors. However, the authors have made their contributions as individuals, and the study does not represent the official views or positions of their employers, the institutions that selected them for participation in the study, the governments of their countries of origin, the Myanmar Institute of Strategic and International Studies, the Norwegian Institute of International Affairs, or the Norwegian Ministry of Foreign Affairs.

In this multi-author study, it has been necessary to reach compromises between different views. The authors endorse the overall direction and content of the study, but not necessarily every statement.

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## Executive summary

- This study examines the implications of climate change and climate policy for international affairs in Southeast Asia and for ASEAN as a multilateral organization. Climate change and efforts to mitigate climate change give rise to major risks as well as opportunities in international affairs. It is therefore in the interest of all countries to be aware of the risks and prepare for them, and the overarching purpose of this study is to support ASEAN and its member states in this area.
- According to the Global Climate Risk Index, four of the world's ten countries most affected by climate change are located in Southeast Asia: Myanmar, the Philippines, Thailand, and Vietnam.
- Given Southeast Asia's complex geography—with numerous archipelagoes, long coastlines, intricate borders, and great-power neighbors—climate change is especially likely to affect interstate relations in the region.
- Climate change may impact on international affairs among the ASEAN countries at several levels. Firstly, changing climatic conditions may affect interstate relations through humanitarian crises, migration, and/or a need for greater imports of vital goods. Secondly, reducing greenhouse gas emissions requires international coordination and cooperation. Thirdly, the global energy transition driven by climate policy may lead to an altered geopolitical situation in the world, including ASEAN.
- The rising sea level, extreme weather events, climate-driven migration, changed river-flow, hydro-power promotion, international cooperation to combat haze, and climate-related food security risks—all have implications for international affairs among the ASEAN member states.
- Several low-elevation areas of Southeast Asia may be affected by the rising sea level. The region has over 50 coastal cities with more than half a million inhabitants. The smaller a country, the greater its population density and the more low-elevation territory it has, the greater are the risks it faces. In addition, the greater the proportion of the population engaged in agriculture, the more likely is climate change to cause migration.
- Migration out of low-lying areas in the broader region is a major potential climate-related trigger of international issues in Southeast Asia. Bangladesh, as one of the world's most populous, densely populated, and low-lying countries, could become a source of rising migration to Myanmar and other ASEAN member states. This could also highlight the divide between majority Muslim and majority non-Muslim states within ASEAN on a greater scale than the 2015 boat refugee crisis did.
- Climate mitigation necessitates a global energy transition, and this has implications for interstate relations. The trend in Southeast Asia has been towards increasing dependence on imports of fossil fuels from the Middle East, entailing growing vulnerability to political developments in that part of the world. This can be counteracted by climate mitigation measures such as reducing fossil-fuel subsidies and increasing the share of renewables in the energy mix. Conversely, a failed energy transition among the ASEAN countries will increase their energy dependency.

## Executive summary

- Failure to move away from fossil fuels, especially coal, may damage the international reputation of the ASEAN countries. Counter to the nationally determined contributions (NDCs) which the ASEAN countries themselves have formulated under the Paris Agreement, the region's coal-based electricity generation capacity has been expanding rapidly. This may also lead to a large number of stranded coal assets in the future.
- All the ASEAN member states have ratified the Kyoto Protocol and signed the Paris Agreement, and nine out of ten have also ratified the Paris Agreement. At least half of the ASEAN member states reacted publicly to President Donald Trump's announcement that the United States would withdraw from the Paris Agreement, criticizing it and/or reiterating their own country's commitment to climate action. ASEAN has identified climate change as a priority issue since the 2007 ASEAN Summit in Singapore. This declared commitment of ASEAN and its member states to international climate policy can provide a good foundation for joint regional climate policy formulation and action.
- However, despite their positive stances on climate change, most ASEAN countries have not taken on prominent roles in international climate policy. As a result, they remain takers rather than makers in international climate politics. ASEAN as an organization stands to gain or lose status by following up or not following up its member states on climate issues, and by member states succeeding or failing to meet their NDCs. The ASEAN Secretariat can fulfill an important function by promoting a team spirit around this status drive.
- ASEAN could formulate a regionally determined contribution (RDC) for ASEAN by adding up the nationally determined contributions of the ASEAN member states. This could help create a team spirit related to the NDCs, as well as possible peer review/pressure.
- ASEAN could implement several other concrete measures to energize its work on climate change: maintain a focus on the NDCs of its member states under the Paris Agreement; ensure that current and future initiatives under the ASEAN Plan of Action for Energy Cooperation (APAEC) are ambitious and detailed as to the reduction of greenhouse gas emissions; highlight the vulnerability of Southeast Asia to climate change by publishing and sharing relevant analysis; advocate improved disclosure and reporting of the financial risks of climate change to governments and investors; put climate change high on the agenda of every ASEAN summit; involve and connect relevant civil society and academic organizations across Southeast Asia; facilitate regional electricity trade through the expansion of the ASEAN Power Grid for better handling of the intermittency of renewable energy; promote the accelerated phase-out of fossil-fuel subsidies—which is also a prerequisite for developing trans-border electricity trade in Southeast Asia.
- To be successful, climate-related initiatives will need to consider the ASEAN way of conducting business, with its emphasis on national sovereignty, non-interference and consensus in decision-making. The United Nations Framework Convention on Climate Change (UNFCCC) has set an example of common but differentiated capabilities and responsibilities, further developed with the Paris Agreement's concept of nationally determined contributions, which are precisely that—nationally determined. This approach is highly compatible with the traditional ASEAN approach to interstate cooperation.
- ASEAN may be experiencing a problem of collective action on international climate policy: the member states are looking to ASEAN to adopt a stronger role, whereas the ASEAN Secretariat looks to the member states to take the lead and give clear signals. A first step towards solving this conundrum could be for the ASEAN Secretariat to further expand and strengthen its climate policy staffing—which will require funding and capacity enhancement.

# Introduction

Climate change can have an impact on international affairs at several levels. Firstly, changing climatic conditions such as sea-level rise, droughts, floods, and storms can affect relations between states through humanitarian crises, migration, greater dependency on imports of vital goods, and even conflict (Brzoska and Frölich 2015; Buhaug et al. 2014). Secondly, climate change is a global problem that cannot be dealt with by any country on its own; reducing greenhouse gas emissions requires international coordination and cooperation. Thirdly, the energy transition required for climate mitigation may lead to an altered geopolitical situation, with new risks as well as advantages. Climate change is therefore both a risk- and an opportunity-multiplier in international relations: it may aggravate existing interstate tensions, or catalyze collaboration across international boundaries.

The overarching purpose of this study is to promote and protect the interests of the ASEAN member states, both as individual countries and collectively. Because climate change and attempts to mitigate climate change entail major risks as well as opportunities in the international affairs of the region (Vinke et al. 2017: iv), it is in the interest of all countries to be aware of them.

The study draws on publicly available data as well as the input of researchers from relevant institutions in all ten ASEAN countries. The contributing researchers gathered for a roundtable in Yangon, Myanmar on June 19–20, 2017, organized jointly by the Myanmar Institute of Strategic and International Studies (Myanmar ISIS) and the Norwegian Institute of International Affairs (NUPI). The roundtable was financed by the Norwegian Embassy in Yangon, facilitated by Khin Maung Lynn (Joint Secretary, Myan-

mar ISIS) and opened by HE U Nyunt Maung Shein (Chairman, Myanmar ISIS), HE Dr AKP Mochtan (Deputy Secretary-General for Community and Corporate Affairs, ASEAN), and Professor Ulf Sverdrup (Director, NUPI) (see Annex for details). Workshop participants made presentations on the international implications of climate change for the foreign policies of their countries and provided written responses to a set of questions, later followed up with written input from each country.

This study is inspired by a report on the geopolitical consequences of the transition to renewable energy recently published by Columbia University, Harvard University, and NUPI (O’Sullivan et al. 2017). The present study on Southeast Asia takes an approach that is more geographically focused, but thematically broader, encompassing the geopolitical consequences of climate change as well as attempts to mitigate climate change. It was decided to broaden the thematic scope of this study because of the particular vulnerability of the ASEAN countries to climate change.

## **Southeast Asia: A hotspot for climate change**

According to the *Global Climate Risk Index*, four of the world’s ten countries most affected by climate change are located in Southeast Asia: Myanmar, the Philippines, Thailand, and Vietnam. Neighboring Bangladesh is also ranked among the top ten (Kreft et al. 2016; see also ADB 2017). This is illustrated in Figure 1. Similarly, the *Climate Vulnerability Index* classifies the region’s population and ecosystems as either “highly” or “extremely” vulnerable to climate change (Maplecroft 2017).

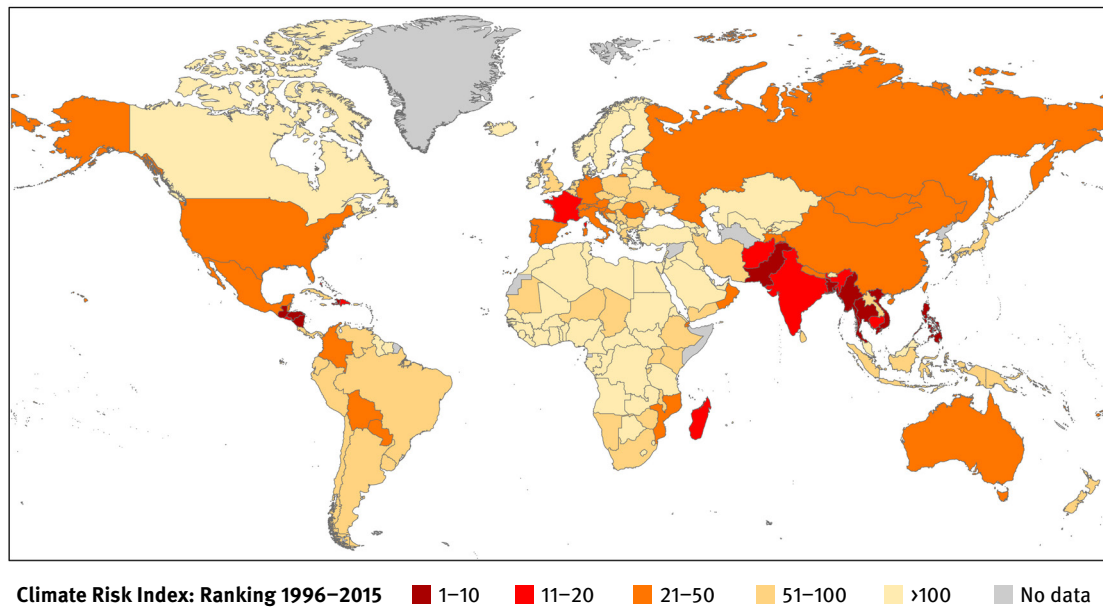


Figure 1. Climate risk by country (lower number / darker color = higher climate risk) (Kreft et al. 2016).

One of the most tangible consequences of global warming is the melting of ice, leading to higher sea levels. The population and economic activity of Southeast Asia are concentrated along the region's coastlines, where there are over 50 cities with more than half a million inhabitants each.

A study conducted by the Asian Development Bank projects a 4.8 °C rise in annual temperature and a 70 cm rise in sea level by 2100 in Indonesia, the Philippines, Thailand, and Vietnam (cited in ASEAN 2015; see also see Vinke et al. 2017: 28; Levermann et al. 2013). This would entail serious problems for many of the region's major coastal and estuary cities, including Bangkok, Jakarta, Manila, and Yangon.

According to one set of estimates, should the Greenland ice melt and flow into the world oceans, the sea level might rise by 6 meters; should all the ice in Antarctica melt, the sea level might rise by 60 meters (NSIDC 2017). Other estimates indicate that sea level is likely to rise by around 1 meter by the end of this century, i.e. within the lifetime of today's children (Vermeer and Rahmstorf 2009: 21527; Jevrejeva et al. 2010: 1).

Estimates of sea-level rise are characterized by considerable uncertainty (van den Broeke et al.

2016: 1933), and are therefore constantly revised in light of new research. What is clear is that there is considerable risk of rising sea levels in the near and more remote future, necessitating large-scale spending to safeguard cities and infrastructure, and resettle coastal populations.

The special geography of Southeast Asia makes it particularly likely that climate change will affect interstate relations. The region has intricate international borders, like those between Thailand and its neighbors, or on the island of Borneo/Kalimantan, which is divided between Brunei Darussalam, Indonesia, and Malaysia. Indonesia consists of over 17 000 islands; the Philippines has over 7000. Myanmar shares direct land borders with great powers China and India; Laos and Vietnam share borders with China, and Brunei Darussalam, Indonesia, Malaysia, and the Philippines all have maritime borders with China (if one takes into account Chinese territorial claims in the South China Sea). This geographical complexity creates many risks of climate-related developments spilling over from one state to another—but also opportunities for countries to coordinate their climate mitigation and adaptation measures.



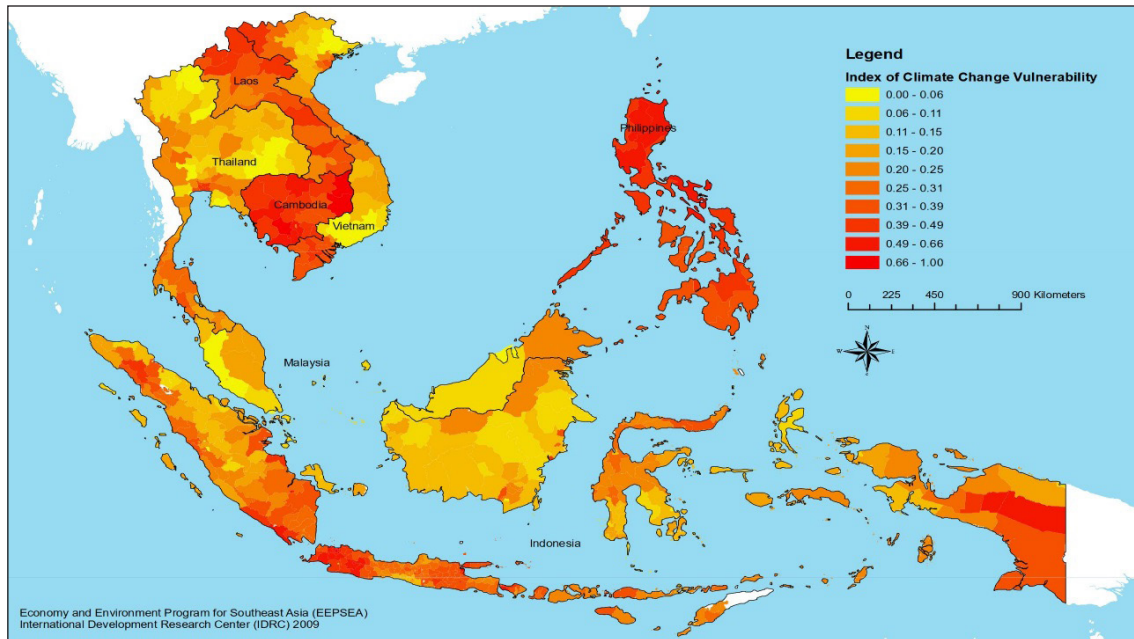


Figure 2. Vulnerability to climate change of ASEAN countries (except Myanmar); darker color = more vulnerable (Finlayson 2016)

The *Global Climate Risk Index* ranks the vulnerability of the individual ASEAN countries to climate change as shown in Table 1.

Table 1. Ranking climate risk of ASEAN countries (Kreft et al. 2016)

1	Myanmar
2	Philippines
3	Vietnam
4	Thailand
5	Cambodia
6	Indonesia
7	Laos
8	Malaysia
9	Brunei Darussalam
10	Singapore

Figure 2 shows a similar picture, broken down by province: almost all provinces in the Philippines and Cambodia, and most in Laos, are considered to be at high risk from climate change. Moreover, as the effects of climate change and climate policy

spill over from one country to another, also other countries will be affected.

### Existing research on climate change and ASEAN

Some research has been conducted on climate change in Southeast Asia, but there has been little attention to the international relations implications of climate change and climate policy for the region and for ASEAN as a multilateral organization.

In addition to creating regional climate-risk scenarios like those mentioned in the introduction, various scholars have examined domestic adaptation to climate change and mitigation measures in Southeast Asia (Koh et al. 2015; Rasiah et al. 2017; Hornoiu 2016; Caballero-Anthony et al. 2015; Syed et al. 2014; Vehmas et al. 2012; Sahraie 2011). The edited volume by Koh et al. (2015) offers a comprehensive collection of studies on adaptation and mitigation measures adopted by individual member states and by ASEAN as an organization, dealing with such topics as sea-level rise, legal framework, future

impacts and vulnerabilities, economic interconnections, climate migrants, adaptation and disaster management as well as risk reduction and humanitarian assistance. A study by Salamanca and Nguyen (2016: 1) classifies the ASEAN countries according to three categories of adaptation policies: adaptation pioneers (Philippines and Vietnam), emerging champions (Cambodia, Indonesia, and Myanmar), and wait-and-see countries (Laos, Malaysia, and Thailand).

According to Salamanca and Nguyen (2016: 5), “most of the adaptation policies currently implemented in the ASEAN Member States are still relatively new...Yet adaptation efforts are increasing.” In his study of climate-change coverage in ASEAN English-language newspapers 2002–2012, Freeman (2017) finds that the attention has grown substantially since 2006, but often involves general normative statements rather than action-oriented solutions.

A few scholars have examined what ASEAN as an organization can do to handle challenges related to climate change (Lassa et al. 2015; Koh et al. 2015; Salamanca and Nguyen 2016). Lassa et al. (2015) call for greater cooperation with the International Panel on Climate Change, and note that shared research activities and data collection across the ASEAN countries could help mitigate the risks of maladaptation. Further, as Goron (2014) points out, the ASEAN voice in UNFCCC negotiations has been quite fragmented and the weight and influence of the ASEAN countries have been limited compared, for instance, to those of the EU countries.

Using a general equilibrium model to assess the impacts of the international climate policy on the ASEAN countries and their energy systems, Ruamsuke et al. (2015) find that Thailand and Vietnam are most vulnerable. Their model indicates, not surprisingly, that clean electricity generation is a major tool for reducing carbon emissions in the region. Other scholars have

studied renewable energy promotion, electricity generation and energy security in ASEAN (Sovacool 2009; Kumar et al. 2013; Huber et al. 2015; Shadman et al. 2016). Shadman et al. (2016) report on a case study of drought in six ASEAN countries and its effect on renewable electricity generation; they argue that a Southeast Asian electricity system based on renewables is vulnerable to drought and that long-term energy planning in ASEAN has ignored climate risk and its impact on energy security.

A few scholars have evaluated the impact of climate change and climate events in ASEAN on business (Amran et al. 2016; Hayakawa et al. 2015). Amran et al. (2016) conclude that few businesses have integrated climate change into their corporate strategies in Southeast Asia, whether as a risk or as an opportunity. Kumar et al. (2013) note that climate change is not the major impetus for biofuel development in the region's major biofuels producers—Indonesia, Malaysia, the Philippines, and Thailand. More important are commercial and socio-economic incentives.

Several works discuss the issue of forced migration in ASEAN (e.g. Petcharamesree 2016; Nethery 2014; Ananta and Arifin 2004; Grundy-Warr 2004). Petcharamesree (2016) discusses the legal framework for handling forced migration in Southeast Asia, and concludes that the creation of a unified regional approach to forced migration is needed. She notes that the ten ASEAN member-states are driven largely by their national agendas and tend not to act until a problem grows into a crisis—as is the case with many other countries around the world.

In sum, there is a growing body of research on the impacts of climate change in South-East Asia. However, the international relations aspect has received little attention, and there is limited awareness of this important element of climate change among the ASEAN member states. This study attempts to fill the gap.

# Analysis: climate-change implications for ASEAN international affairs

## Sea-level rise

Rising sea levels will have profound implications for states and the relations between them. As indicated above, due to its complex maritime geography, Southeast Asia will be affected more than most other parts of the world. The territories of all non-landlocked states will shrink, especially those with long coastlines and/or significant low-lying areas. Out of the world's 25 cities most vulnerable to a 1-meter sea-level rise, as many as 19 are located in the Asia-Pacific region, 7 of them in the Philippines alone (Brecht et al. 2012). But it is Indonesia that is expected to be hardest hit by coastal flooding, with 5.9 million people affected every year by 2100 (McLeod et al. 2010; Vinke et al. 2017: 33).

Beyond reductions in territory, altered coastlines will change the baseline calculations used to estimate territorial waters and exclusive economic zones under the United Nations Convention on the Law of the Seas (UNCLOS), to which all the ASEAN countries are signatories, including landlocked Laos.<sup>1</sup> These changes will affect maritime defense systems as well as the rights to fisheries and other offshore natural resources.

<sup>1</sup> Cambodia has signed but not ratified UNCLOS.

Table 2. Low-elevation coastal area and population, selected Asian countries

Country	Low-elevation coast (LEC) as % of total surface area	LEC population as % of total population
Bangladesh	40	49
Cambodia	8	26
China	2	11
India	3	6
Indonesia	9	18
Myanmar	7	28
Pakistan	3	3
Philippines	7	17
Thailand	7	26
Vietnam	20	55

Sources: adapted from Vinke et al. 2017: 11; Neumann et al. 2015

Treat et al. (2013) present an extreme scenario, in which all the ice in the world melts and flows into the oceans. This scenario is unlikely to materialize in the foreseeable future, but it provides pointers on sensitive geographical areas. Figure 3 shows how this would play out in Southeast Asia. Bangkok, Ho Chi Minh City, Jakarta, Manila, and Singapore would vanish, along with most of Cambodia and Singapore and large parts of Kalimantan, the Irrawaddy Delta, Southern Vietnam, Sumatra, and central Thailand. Southeast Asia's populous neighbors would also be hard hit, forcing large numbers of people to search for new places to live. China's most densely populated coastal areas, currently home to some 600 million people, would be submerged, as would Bangladesh with a population of over 160 mil-



Figure 3. Altered coastlines after the melting of all ice on earth (Treat et al. 2013).

lion and India's entire eastern seaboard with a population of several hundred million.

Much of Singapore is flat and low-lying—30% of the country has elevations of five meters or less—and is therefore particularly vulnerable to rising sea levels (National Climate Change Secretariat 2017). Singapore has already begun mitigation efforts to prepare for this. In 2011, the minimum land reclamation level was raised from 3 to 4 meters (Tang 2017). In addition, seawalls and rock slopes already protect over 70% of Singapore's coastline (Tang 2017). Thanks to the country's small surface area, the cost of raising these to protect against higher sea levels is comparatively low (Ng and Mendelsohn 2005). In a very long-term perspective, should much of the ice on the South Pole melt and sea levels rise more dramatically, the challenges for Singapore might be greater, perhaps threatening the very survival of the city state.

The impact of rising sea levels on maritime territorial rights has received some attention in the general academic literature (Ruppel 2015: 100; Vidas 2014; Di Leva and Morita 2008; Caron

2009), but surprisingly little in Southeast Asia. However, VornDick (2012) argues in an op-ed in *The Diplomat* that Chinese claims in the South China Sea are likely to be undermined by rising sea levels. One of China's strategies for claiming maritime territory in the South China Sea is to create or expand artificial islands and reefs whose surrounding waters it can then claim. Due to climate change, China may find that some of these newly created territories are no longer above sea level. Another perspective is that, if demand for oil and gas falls due to international climate policy and/or disruptive technologies, the parties to the South China Sea maritime territory disputes may also come to view the anticipated offshore fossil petroleum resources as less valuable, potentially dampening these disputes.

### Extreme weather events

Another important aspect of climate change is the expected worsening of extreme weather events. The extent of the impact of climate change on extreme weather events is not known with certainty, but it is likely that such events will become

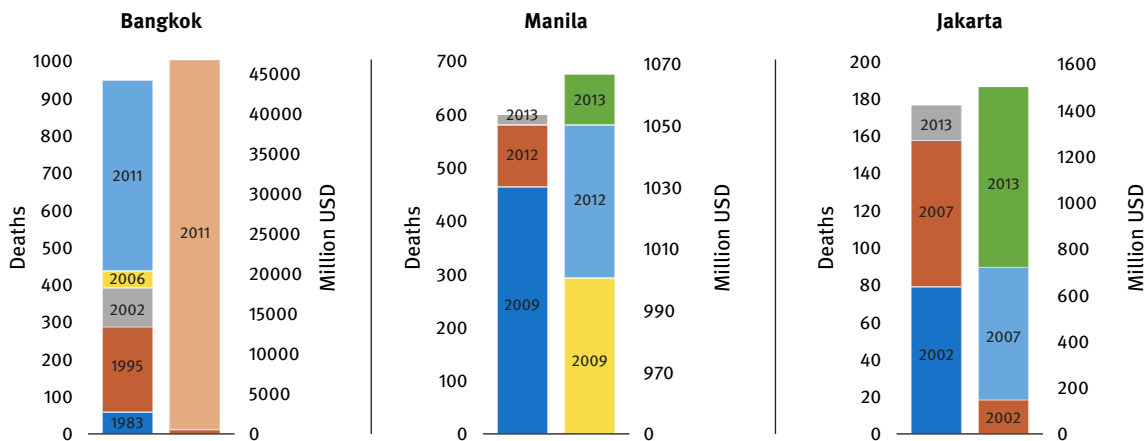


Figure 4. Impact of extreme weather events on three Southeast Asian megacities 1980–2017 (data collated from numerous sources)

harsher (Vinke et al. 2017: xi). Southeast Asia is already experiencing the impact of such events. Many parts of the region are affected, but data availability is best for the largest cities, as shown in Figure 4.

One of the most extreme recent weather events that the region has experienced was Cyclone Nargis, which killed over 138 000 people in Myanmar in 2008 (Brakenridge et al. 2017: 81; Howe and Bang 2017: 58; Seekins 2009: 717; Junk 2016: 78). Such a natural catastrophe and its humanitarian consequences create obligations for other countries to get involved—which, in the case of Myanmar’s military government, triggered fears of foreign political intervention (Barber 2009; Seekins 2009; Selth 2008).

Another extreme weather event in recent years was Typhoon Haiyan, which struck the central Philippines province of Leyte in 2013, killing at least 10 000 people and bringing extensive economic damage (*The Guardian* 2013a; Brower et al. 2014). Importantly for the focus of this study, it also caused a rise in cross-border migration (Mosuela and Matias 2015: 99; Lum and Margesson 2014). This illustrates how extreme weather events have an impact not only on the countries they strike, but may also indirectly affect other countries and interstate relations.

## Migration

Along with changes in precipitation, rising sea levels are an important potential driver of migration. As discussed above, several low-lying parts of Southeast Asia may be affected by rising sea levels, and people may need to find new places to live. The more low-lying areas, the greater the population density and the smaller the surface area of a country, the greater is this risk. In larger countries with more varied geographies, such pressures may in large part be resolved through internal migration. However, even in such countries, this may prove costly. For example, in Vietnam the majority of the population is concentrated on the fertile plains between the mountains and the sea. Although this is a large country with many higher-lying areas, large numbers of people could find themselves displaced, and alternative settlement areas available within the country would not be as fertile.

The likelihood of international migration in response to climate change is heightened by the fact that several countries in the region already have well-established patterns of emigration—partly to other ASEAN countries, partly to other parts of the world (see Figure 5).

Except for Brunei Darussalam and Singapore, all ASEAN member states are already major sources of outbound migration, each having over a million nationals abroad (ILO 2015). There are

Analysis: climate-change implications for ASEAN international affairs

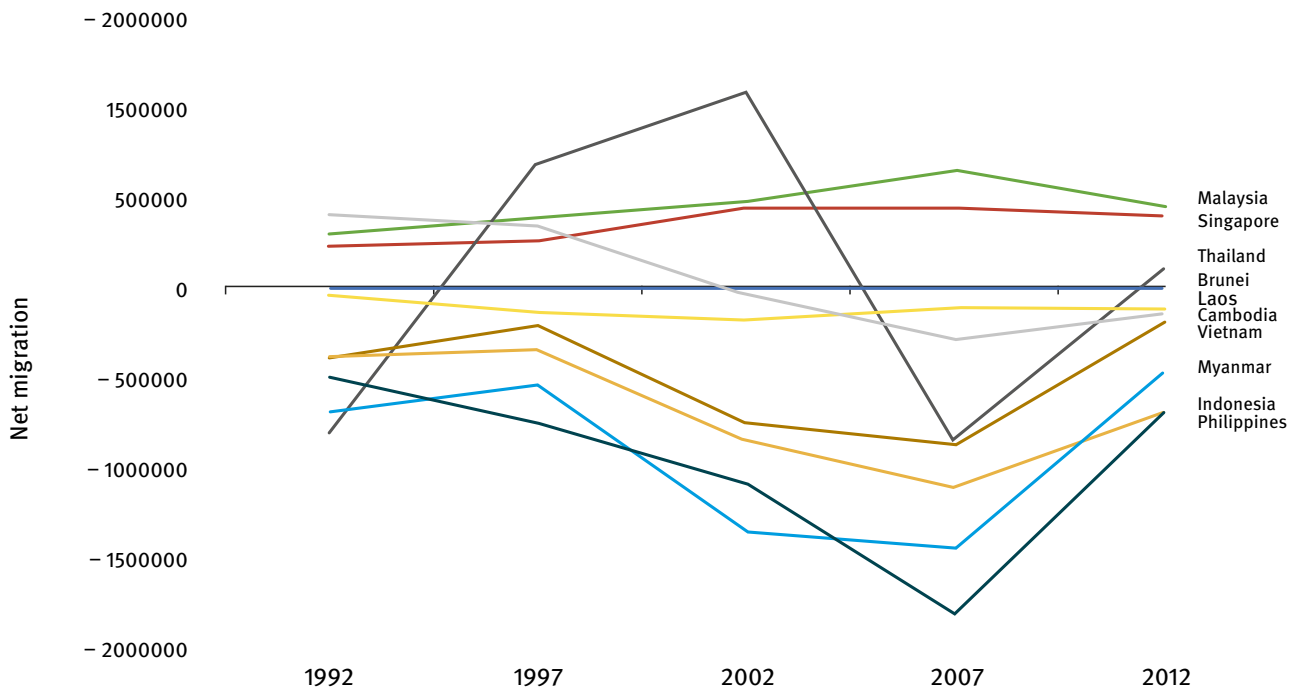


Figure 5. Net migration, Southeast Asian states (data from World Bank 2016)

over 10 million ethnic Filipinos working abroad, of which 41% are temporary labor migrants, 11% are irregular migrants and the remaining 48% are considered permanent migrants (CFO 2013). As a consequence, interaction with other states over the status and rights of overseas Filipinos is an important aspect of Filipino diplomacy, and the Filipino government has made protection of overseas Filipinos the third pillar of the country's foreign policy.

Migrant issues are also important for other major labor-exporting and -importing countries and the relationships between them—for example between Cambodia and Malaysia, Cambodia and Thailand, and Myanmar and Thailand (Lim and Hong 2016). In 2011, following the exposure of serious abuse cases, Cambodia imposed a ban on sending domestic maids to Malaysia. The ban was lifted in 2015, when both governments signed a new memorandum of understanding on resuming deployment of low-skilled laborers to Malaysia. In mid-2014, when the Thai military junta came to power, approximately 220 000 Cambodian laborers were forcibly deported back to the

border by truck. The Cambodian government promptly responded that the Thai government should be held responsible. The Thai government continues to send illegal migrant workers back to Cambodia, but the two governments have been trying to find ways to resolve this tension and limit the strain on their bilateral relationship.

The greater the proportion of the population engaged in agriculture, the more likely is climate change to cause migration. A recent study of the Philippines and Vietnam notes lack of water for agriculture as one of the main causes of migration among young people (Anderson et al. 2017). Bohra-Mishra et al. (2017) find that rising temperatures and typhoons cause outmigration in the rural Philippines through their negative impact on crop yields.

Malaysia is among the ASEAN countries thought to be less sensitive to climate change, and probably less likely to experience large-scale internal climate-related migration (Hassan et al. 2016: 25–36). However, Malaysia is already host to some three million migrants from many countries (ILO 2015: 18)—a large number for a

country that is not even a signatory to the 1951 Refugee Convention. A new influx of migrants driven by climate change would place further strain on the Malaysian government and society.

Also Singapore is a magnet for migrants from across Southeast Asia. It might well become the target destination of large numbers of people in the case of a climate-induced wave of migration. However, Singapore is also a small country with simple borders which it has been managing with increasing strictness. Many attempted illegal immigrants are arrested; punishments include prison sentences, caning, and deportation. It therefore seems unlikely that Singapore would be significantly affected by a future climate-related migration wave (Thng 2015; Osada 2015).

The potentially largest source of climate-related migration in the broader region is Bangladesh, due to several factors. Firstly, Bangladesh, with its almost 163 million inhabitants, is one of the world's most populous countries. Secondly, it is the world's most densely populated country, except for some small countries. In the words of Harris (2014), "160 million people live in a place one-fifth the size of France and as flat as chapati." Thirdly, it is one of the world's most low-lying countries.

According to estimates by Rajan (2008), with a 1-meter sea-level rise scenario, displacement of 5.73 million Bangladeshis can be expected by 2050, and 41.62 million by 2100. With a sea level rise scenario of 3 meters, displacement by 2100 is estimated at 58.25 million; with a rise of 5 meters, 75.82 million (see also Rahman et al. 2011; Paul and Rashid 2016). If the Paris Agreement is fully implemented, the sea level may rise by 0.65 meters by the year 2100; under a business-as-usual scenario it may rise by 1.4 meters by 2100, and for every 1° C of global warming the sea will rise another estimated 2.3 meters (Vinke et al. 2017: xi). Neighboring India and Myanmar are unlikely to welcome large numbers of migrants from Bangladesh. The entire eastern seaboard of India is low-lying and at risk of rising sea levels; this makes it difficult to imagine India as being eager to accommodate many displaced Bangladeshis, not least since Bangladesh (as well

as then Western Pakistan) was separated from India because it was thought difficult to integrate Bangladeshi Muslims with Indian Hindus.

There is already a history of tensions between Bangladesh and Myanmar over ethnic, refugee, and human rights issues. While the impact of climate change and extreme climate events on migration from coastal Bangladesh is well studied (e.g., Stojanov et al. 2016; Saha 2017; Islam and Shamsuddoha 2017; Mallick et al. 2017; Roy 2017; Bose 2016), there has been hardly any analysis of the potential impact on the ASEAN countries.

As illustrated by events in 2015, climate-induced migration carries risks not only for bilateral relations between Bangladesh and Myanmar, but also for international relations in the broader region. That year, some 25 000 Muslims set off from Myanmar in poorly equipped boats to Indonesia, Malaysia, and Thailand, but were not welcomed anywhere, sparking disagreement among these countries and highlighting the divide between Muslim-majority and non-Muslim majority states within ASEAN (UNHCR, cited in Miles 2015). Compared to some of the scenarios for climate-induced displacement from Bangladesh, 25 000 boat refugees is a relatively small number. Much larger waves of migration could cause considerably more interstate tension.

### **Altered river flow**

Some of the world's largest rivers have their headwaters in the Himalayan glaciers, and supply water to millions of people across East, South, and Southeast Asia. Climate change leads to glacial melting, which can render river flow more dependent on annual precipitation and therefore more unstable. This in turn may force local communities in downstream rural areas to change their traditional food production patterns, potentially leading to migration and impacting relations between countries.

Three major Himalayan rivers originate in Tibet and then flow through Southeast Asia: the Irrawaddy, the Mekong, and the Salween.<sup>2</sup>

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<sup>2</sup> The Irrawaddy originates in territory disputed by China and Myanmar.

The longest of these three, the Mekong, flows through six countries. The lower Mekong Basin alone is home to 60 million people, out of which an estimated 40 million are involved in capture of wild fish (Grill et al. 2014; Thompson et al. 2014; Kuenzer et al. 2013; Mekong River Commission 2010).

Also hydroelectric dams can also create riverine complications. They help states achieve their Paris Agreement commitments on greenhouse gas emissions and can be a significant source of low-cost, reliable, renewable energy for local populations and generate economic benefits for the region. However, they can also have negative impacts on downstream communities and ecosystems, including fisheries and agriculture. The 400-odd existing and planned dams in Bhutan, China, India, Nepal, and Pakistan will affect the ecology of the Himalayas; some of them will also affect conditions downstream in Southeast Asia (*The Guardian* 2013b).

The damming of the Mekong River has significant transboundary implications. There are already tensions between Vietnam on the one hand and China and Laos on the other. In particular, Vietnam has expressed significant concerns about Laos' current approach to hydropower development. Vietnam is apprehensive that Laos has underestimated the costs and environmental impacts of dam construction and that proper feasibility research has not been conducted. But, despite being linked by the Mekong, it is difficult for the other Southeast Asian countries to influence Laos. The international treaty between these countries, the Mekong Agreement, only requires Laos to consult its neighbors about their views through the Mekong River Commission. Commercial interests also play a role, with Chinese, Malaysian, and Thai companies involved in dam construction in Laos (Wright 2016). Proper regional planning is required to improve coordination among the states in the area.

China is the largest source of external investment in Southeast Asian hydropower. The Chinese play a significant role in dam construction in several ASEAN countries: Cambodia, Indonesia, Laos, Myanmar, the Philippines, and Vietnam

(Asian Power 2013; Urban et al. 2013; Biba 2012; Wade 2011: 18; Liebman 2005). The Myitsone Dam project in Myanmar is particularly controversial, due to its large reservoir which will threaten biodiversity, alter traditional livelihoods, and displace local communities. Moreover, this dam project is located near the Sagaing seismic fault-line, and a large share of the electricity it generates will be exported to China (Ives 2017; Kiik 2016; Reilly 2013; Hilton 2013). The Myitsone Dam project has occasioned protests both inside and outside Myanmar. It may even have played a role in the decision of Myanmar's previous military government to open up the country politically, in order to have Western sanctions eased and escape from dependence on China (Shannon and Farrelly 2014: 28; Sun 2012). As climate change has understandably not been high on the agenda among economically impoverished communities in Southeast Asia, discussion of Chinese investments related to the Myitsone Dam and other hydropower projects across the region has focused on the local environment in impact and on the rights of the local population. However, if the population of Southeast Asia becomes more climate conscious, the public debate could possibly shift to weighing the pros and cons of Chinese influence and climate mitigation. In any case, Chinese hydropower investment is an important dimension of relations between China and the ASEAN countries. Even without climate change, rivers and hydropower dams are fraught with international issues. When receding glaciers, altered precipitation patterns, and already climate-stressed downstream agricultural communities are considered, the need for additional attention to the transboundary implications of rivers and dams becomes clear.

### **Haze**

Transboundary haze is an international relations issue in ASEAN, because of its transboundary effects on air quality and human health (Koplit et al. 2016). The haze originates from agriculture-related fires in East and South Sumatra and parts of Kalimantan and affects neighboring countries, Malaysia and Singapore in particular.



Haze pollution in ASEAN and its significant economic, health and other impacts on the region have been widely studied (Cotton 1999; Odihi 2001; Byron 2004; Tacconi et al. 2008; Nguitragool 2002; Forsyth 2014; Varkkey 2014; Nurhidayah et al. 2015; Yong and Peh 2016; Sabuti and Mohamed 2016; Lee et al. 2017; Ng 2017; Nesadurai 2017; Nazeer and Fumitaka 2017). ASEAN member states signed the ASEAN Agreement on Transboundary Haze Pollution in 2002, which is still the only ASEAN-wide environmental agreement. However, transboundary haze remains an enduring concern for the ASEAN countries. In 2013, the haze caused a diplomatic row, with Indonesia arguing that Malaysian and Singaporean companies with plantations in Indonesia were among those starting the fires.

Dealing more effectively with the haze can present an opportunity for the ASEAN countries to partner to reduce harmful forest-clearing practices. Working together on this can be a good way of achieving international cooperation, while also promoting climate mitigation and improving health (Koplitiz et al. 2016).

### **Food security**

Various studies have examined the impact of climate change and extreme climate events on agriculture and food production in Southeast Asia (Bohra-Mishra et al. 2017; Lassa et al. 2015; Chan et al. 2017; Caballero-Anthony et al. 2015; Chen et al. 2012). A large proportion of the region's workforce is engaged in primary sector occupations—agriculture, forestry, and fisheries—all of which are especially vulnerable to climate change. Projections of losses include a 50 percent decline in rice yields and a 6.7 percent fall in GDP by 2100 (ASEAN 2015). Lassa et al. (2015) stress that ASEAN agriculture, and rice production in particular, are at risk from droughts and flooding. They conclude by offering a set of policy measures to mitigate the influence of climate change on food security in ASEAN, and recommend that the ASEAN Secretariat should coordinate these measures with the International Rice Research Institute (IRRI) and the Southeast Asian Regional Center for Graduate Study and

Research in Agriculture (SEARCA) on climate science and impacts on agriculture.

Within Southeast Asia, issues of food security, failed crops, and migration are closely interconnected (Rutten et al. 2014; Chan et al. 2017). Rutten et al. (2014) argue that investments in Vietnam and the Mekong River Delta will need to address the complexity of links between population, agriculture, land, and climate mitigation and adaptation measures. Several scholars also note that climate change is the most serious rising threat to the fisheries sector in many ASEAN countries, and may reduce food insecurity if not dealt with properly (McNeely and Suksawang 2017; Chan et al. 2017; Amran et al. 2016).

### **Global energy transition**

Reducing greenhouse gas emissions will necessitate a transition away from fossil fuels. This is to some extent an issue of domestic policy, but also has implications for five different aspects of relations between countries. Firstly, both reducing subsidies for fossil fuels and increasing the share of renewables in the energy mix would counteract the current trend towards *increasing* dependence on imported fossil fuels among the ASEAN member states (Pickford 2017). Such increasing reliance threatens to render most ASEAN member states dependent on fossil-fuel imports (see Figure 6). Even Malaysia, the region's second largest oil producer, is on the verge of becoming a net importer. Dependence on fossil-fuel imports reduces the energy security of countries, exposing them to political developments in the Middle East (Overland 2015). This heightens the risk of entanglements with China and other East Asian countries which also depend increasingly on oil imports from the Middle East.

Secondly, transition to large-scale use of renewable energy will require further integration of electricity grids between countries, to provide grid balancing and counteract the intermittency inherent in most forms of renewable energy (Brouwer et al. 2014; Suberu et al. 2014). Since 1997, greater electricity integration has been conceptualized as the ASEAN Power Grid (APG). However, although there

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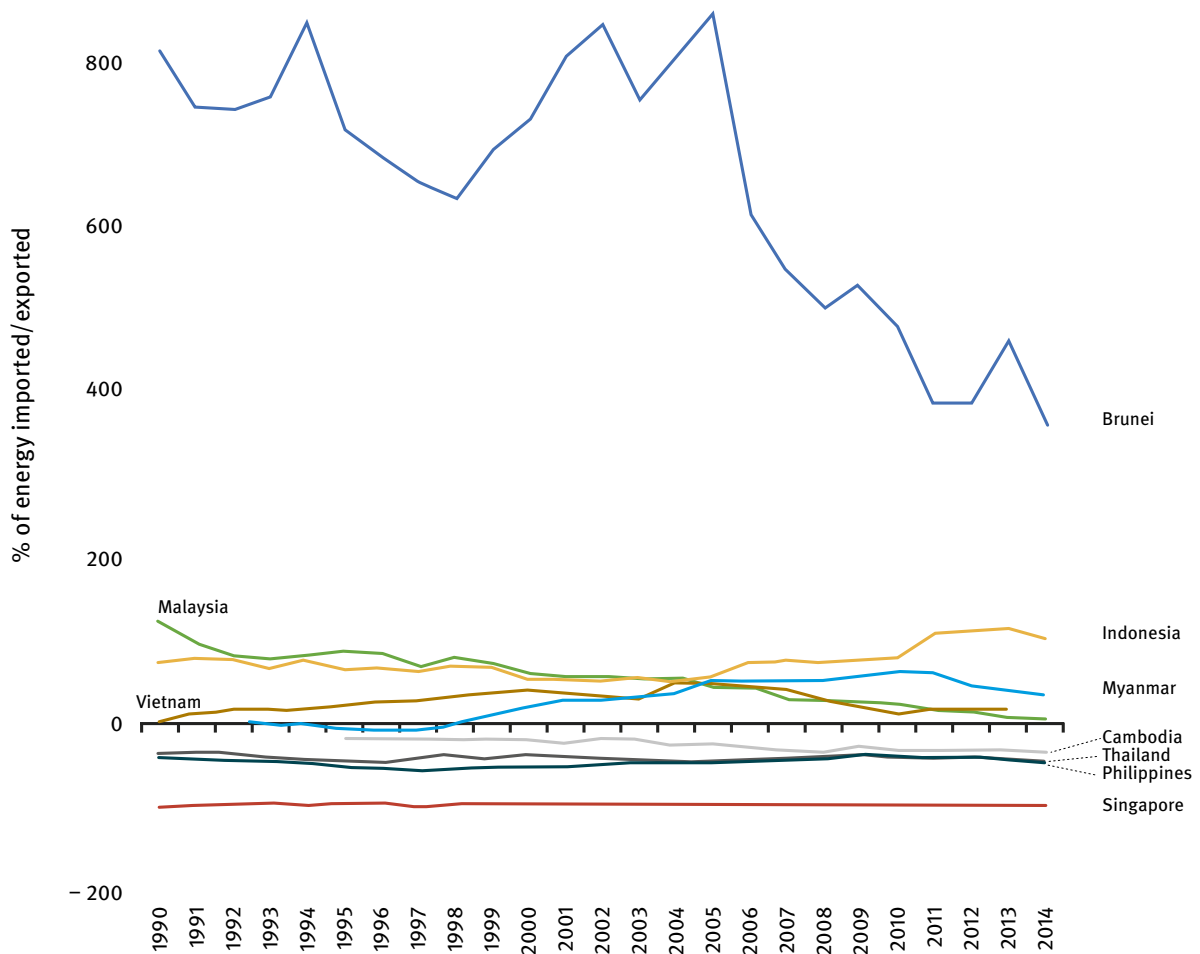


Figure 6. Energy dependence of ASEAN countries (data source: World Bank 2017)

are already eleven power lines between six pairs of ASEAN countries, seven of these connections involve Thailand; all electricity trade has remained bilateral, and several ASEAN countries have no connections with any ASEAN neighbors (Andrews-Speed 2016: 2; Ahmed et al. 2017). Thus, the energy transition represents a possibility for increased cooperation within ASEAN. As we argue in the recommendations, this is an opportunity that could be actively pursued by ASEAN as an organization.

Thirdly, a failed energy transition away from fossil fuels in the ASEAN countries may damage their international reputation and result in stranded assets. The current trend is towards

rapid expansion of coal-based electricity generation capacity in Southeast Asia, with 358 new coal-fired power plants planned in the ASEAN countries between 2011 and 2030 (Koplitz et al. 2017: 1468). Coal is projected to become the largest energy source for ASEAN from 2040 onwards (Ahmed et al. 2017: 1423). This contradicts the nationally determined contributions (NDCs) that the ASEAN countries themselves have formulated, and may also lead to a large number of stranded coal assets in the future. Furthermore—and of greater relevance to this study—this could damage the international standing of the ASEAN countries in the international arena. Here we may

recall how Germany's continued reliance on coal has rendered its ambitious *Energiewende* less impressive than it might otherwise be.<sup>3</sup> A tarnished reputation on climate action may in turn reduce a country's influence in other important issue areas.

Fourthly, those Southeast Asian countries that are net fossil energy exporters may experience reduced demand for their commodities, due to the energy transition in the rest of the world. This would weaken their trade balances as well as their geo-economic position, and is of special concern for the region's net oil exporters—Brunei, Malaysia, and Vietnam.<sup>4</sup> For Indonesia, the situation is complicated. On the one hand, Indonesia is a net importer of oil (when both crude oil and oil products are taken into account), so lower oil prices might be a good thing. On the other hand, Indonesia rejoined OPEC in 2015, hoping to become a net explorer oil-exporter again. Should international oil markets dwindle, that move might seem less meaningful in hindsight.

Indonesia also vies with Australia for the position as the world's largest coal exporter (IEA 2016: 6; Workman 2017)—and coal exports are an evident liability under the Paris Agreement. Indonesia is also the world's fifth largest exporter of liquefied natural gas (LNG), while Malaysia is an even greater exporter of LNG, placing it third in the world (Statista 2017). Although natural gas is sometimes cast as a bridge fuel from a high- to a low-carbon energy system, its market basis in a decarbonizing global energy system also involves major uncertainties, as some of the natural gas produced must be burnt to generate the energy to cool the rest of the natural gas

to -162°C for liquefaction and transportation, generating additional greenhouse gas emissions (Ulvestad and Overland 2011). In our review of the literature, little evidence was found that Southeast Asian energy exporters had considered the threat posed by the global energy transition to their roles as exporters in the international energy system.

Finally, the global energy transition can bring new opportunities for cooperation with countries outside Southeast Asia. This is especially true of the four great powers that vie for influence in the ASEAN region: China, the European Union, Japan, and the USA. All appear keen to gain a foothold in this region, with its population of over 600 million and rapidly growing markets. Not least, these powers are stimulated by each other's engagements in the region, which in turn creates opportunities for the Southeast Asian countries to cooperate with multiple great powers. One country where this can be observed is Myanmar, where China and Japan have been offering different energy investments.

### **International climate-policy commitments of the ASEAN countries**

The existing commitment of the ASEAN member states to international climate policy provides a good foundation for joint regional climate-policy formulation and action. All ASEAN member states have ratified the Kyoto Protocol and signed the Paris Agreement, and nine out of ten have ratified the Paris Agreement (see Table 3), with Myanmar expected to do so in the near future.

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3 On Germany, see Renn and Marshall 2016; Lauber and Jacobsson 2015. On the role of status in international relations, see Biba 2016; Freedman 2016.

4 Vietnam is a net exporter of crude oil, but net importer of oil products (EIA 2017).

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Table 3. Commitments to international climate policy

Country	Kyoto Protocol ratification	Paris Agreement ratification	Emission reduction (unconditional)	Emission reduction (conditional)	Reference year	Target year
Brunei	2009	Sept. 21st, 2016	Activity-related targets: Reduce energy consumption by 65% increase share of renewables to 10%; reduce morning peak hour CO <sub>2</sub> emissions from vehicles by 40%; increase total gazetted forest reserves from the current 41% to 55% of total land area.		BAU	2035
Cambodia	2002	Feb. 6, 2017	-	27% (+land use, land-use change and forestry)	BAU	2030
Indonesia	2004	Oct. 31, 2016	29%	41%	BAU (2010-)	2030
Lao PDR	2003	Sept. 7, 2016	Activity-related targets: increase forest cover to 70% of total land area; increase renewable energy to 30% of its energy consumption		2000-2015	2015-2030
Malaysia	2002	Nov. 16, 2016	35% (per unit GDP)	45% (per unit GDP)	2005	2030
Myanmar	2003	Pending	Sectors have been identified for mitigation, but without specific emission targets			
Philippines	2003	April 22, 2016	-	70%	BAU (2000-)	2030
Singapore	2006	Sept. 21, 2016	36% (per unit of GDP)		2005	2030
Thailand	2002	Sept. 21, 2016	20%	25 %	BAU (2005-)	2030
Vietnam	2002	Nov. 3, 2016	8%	25 %	BAU (2010-)	2030
China	2002			-60 %		2030
EU	2002			-40 %		2030
India	2002			-35 %		2030
USA				-28 %		2025

BAU = business-as-usual scenario as reference for emissions reduction  
Sources: UNFCCC 2017a, 2017b; UNTC 2017; World Bank 2017

Table 4. ASEAN reactions to US withdrawal from Paris Agreement

Indonesia	Withdrawal is not in line with a commitment to international cooperation. No country can face climate change alone, international cooperation is needed.	Arrmanatha Nasir, Speaker of the Indonesian Ministry of Foreign Affairs (Arisandi 2017).
Malaysia	“Profound regret and deep concern”. “Retrogressive”. As the world’s second-largest emitter of greenhouse gases, and with a per-capita emissions level that far exceeds the global average, the USA has a “moral obligation” to continue to champion environmental issues. However, with the drive and dedication shown by other countries to battle the issue of global warming, coupled with great powers such as China and the European Union assuming leading roles, the Paris Agreement will continue to be a success despite the US withdrawal.	Wan Junaidi Tuanku Jaafar, Minister of Natural Resources and Environment ( <i>The Sun Daily</i> 2017; <i>The Malaysian Insight</i> 2017).
Philippines	“The Philippines is deeply troubled by the decision of the US to withdraw from the Paris Agreement and appeals that they reconsider their position. The US, as the second largest emitter of greenhouse gases, and more importantly, one of the world leaders, would have played a key role in creating the much-needed global paradigm shift towards a more climate-resilient and climate-smart future.”	Climate Change Commission under the Office of the President (2017).
Singapore	“Disappointed” at the decision and called for a continued push in global support for the Paris Agreement. “A great pity.” Climate change is a “clear and present danger,” the resolution of which requires a concerted global effort.	Masagos Zulkifli (2017); Minister for the Environment and Water Resources; Vivian Balakrishnan, Minister for Foreign Affairs; Channel News Asia (2017).
Thailand	Reiterated Thailand’s commitment and the importance of the Paris Agreement.	ONEP Thailand 2017.

At least half of the ASEAN member states also reacted publicly to President Donald Trump’s announcement in 2017 that the United States would withdraw from the Paris Agreement, criticizing it directly and/or reiterating their own country’s commitment to climate action (see Table 4).

### ASEAN’s role on climate and energy policy

ASEAN has helped promote cooperation and integration among its member countries on climate policy. Since the ASEAN Summit in Singapore in 2007, ASEAN has repeatedly identified climate change as a priority issue to be addressed by the organization. An ASEAN Climate Change Initiative (ACCI) and an ASEAN Working Group on Climate Change (AWGCC) were established in 2009. The ASEAN Leaders then adopted the Statement on Joint Response to Climate Change (2010), followed by the adoption

of the ASEAN Action Plan on Joint Response to Climate (AAPJRC) by the ASEAN Environment Ministers in 2012. The ASEAN Summits have periodically issued statements pertaining to climate change (2007, 2009, 2010, 2011, 2014, 2015 and 2016), expressing the common aspirations of the member states to tackle climate change through national and regional commitments. These have been issued especially in connection with the UNFCCC COPs, including at COP-22 in 2016. The current ASEAN Community Blueprint to 2025 includes a specific section on Sustainable Climate, with references elsewhere in the document to climate change as well. The AWGCC serves as the primary sectoral body within ASEAN focusing specifically on climate-change matters. Due to the inter-connected nature of this issue with several other sectors, the current work plan of AWGCC has a special section devoted to cross-sectoral coordination and global partnership.

The importance of climate change is also mentioned in the memorandum developed by the ASEAN Institutes of Strategic and International Studies (ASEAN ISIS) on February 15, 2017, titled *The Future of ASEAN: Meeting the Challenges of a Changing Global and Regional Landscape* (ASEAN ISIS 2017). According to the memorandum, “efforts at mitigation can only be effective through coordinated efforts...” It also notes the difficulty of coordination due to differing levels of development in the individual ASEAN member states.

Recognizing ASEAN’s past efforts and continuing challenges, the organization could play an even more proactive role in promoting cooperation on climate policy (Astriana 2015). Indeed, nearly all Southeast Asian contributors to this study have stated that ASEAN could further strengthen its leadership on climate issues. The next section outlines several specific recommendations for how ASEAN could achieve this new and bolder role.

# Recommendations for ASEAN

In practice, international climate policy is conceptualized and formulated mainly in the wealthy Western countries. Although they negotiate with other countries, most of the policy initiative and push, as well as the underlying climate science, originate in the West. Also ASEAN's largest neighbor, China, through its proactive industrial policy on solar panel manufacturing and its clear stance on the Paris Agreement, has assumed a leading role.

Despite their positive stances, most ASEAN countries have not taken on such forward-leaning roles in international climate policy. As a result, they have remained takers rather than makers on many climate issues. This is a lost opportunity for ASEAN as an organization. It can gain or lose status in international affairs by following up or not following up its member states on climate issues, and by its member states succeeding or failing to meet their nationally determined contributions under the Paris Agreement. ASEAN can fulfill an important function by creating a team spirit around to the nationally determined contributions of its member states. The following are some suggestions for ways in which ASEAN might approach this:

## Follow up the NDCs

- Monitor and publicly comment on the implementation of nationally determined contributions by the ASEAN member states.
- Formulate a regionally determined contribution (RDC) for ASEAN by adding up the nationally determined contributions of the ASEAN member states. This could help create a team spirit related to the nationally determined contributions, and possible peer review/pressure.

## Build competence and awareness

- Ensure that current and future ASEAN Plan of Action for Energy Cooperation (APAEC) initiatives are highly visible and aligned with ASEAN's commitments to climate change and reduction of greenhouse gas emissions (Lidula et al. 2007).
- Highlight the vulnerability of Southeast Asia to climate change by publishing and sharing relevant analysis. For example, comprehensive regional data on extreme weather events and their consequences could be made more readily available.
- Advocate improved disclosure and reporting of the financial risks of climate change for governments and investors.
- Leverage the privilege of the country chair of ASEAN each year to prioritize climate change on the organization's agenda.
- Place climate change high on the agenda of every ASEAN Summit.
- Involve and connect relevant civil society and academic organizations across Southeast Asia on issues of climate change.
- Ensure that the long-planned ASEAN Institute for Green Economy becomes operative and is well resourced.
- Transfer knowledge via the sharing of best practices and technology-related investments in clean energy.

## Promote regional energy integration

- Facilitate regional electricity trade through an expansion the ASEAN Power Grid (APG) to manage the intermittency of renewable energy.
- Promote the phase-out of subsidies for fossil fuels, which would facilitate the development of regional electricity trade.

- Develop regional benchmarks for clean energy measures and practices.
- Encourage joint renewable energy projects, transboundary pump power solutions, green finance investment, trade in renewable energy technology, relevant educational projects (including joint MSc and PhD programs between universities in different ASEAN countries), and staff exchanges between government institutions in ASEAN member states on issues related to energy and the environment.
- Broker partnerships among ASEAN member states and between ASEAN member states and non-ASEAN countries and companies.

**Promote cooperation on other transboundary climate issues**

- Building on ASEAN’s work on transboundary haze, explore the adoption of transboundary strategies on water resources management, extreme weather conditions, climate-induced migration, coastal and marine ecosystems protection, and outbreaks of heat-related disease.

**Underlying principles**

In advancing ASEAN cooperation on climate policy, it will be essential “to promote and ensure balanced social development and sustainable environment that meets the needs of the peoples at all times,” as emphasized in the document

*ASEAN 2025: Forging Ahead Together* (ASEAN 2015). The highly diverse economic and social conditions across the Southeast Asian countries make a one-size-fits-all approach inappropriate. To be successful, any climate-related initiatives will need to consider the ASEAN way of conducting business, which emphasizes national sovereignty, non-interference, and consensus in decision-making. Such an approach can help allay potential tensions among ASEAN member states and discourage the ASEAN Secretariat from overreaching. The United Nations Framework Convention on Climate Change (UNFCCC) has set an example of common but differentiated capabilities and responsibilities, further developed in the Paris Agreement with the concept of nationally determined contributions, which are precisely that: nationally determined. This approach is highly compatible with the traditional ASEAN approach to interstate cooperation.

The combination of strong support for a more proactive role for ASEAN on climate policy and the organization’s traditional consensus style and cautiousness in policymaking give rise to a collective action problem: the member countries wait for ASEAN to take a stronger role, while ASEAN looks to its member states for someone to take leadership. A first step might be for the ASEAN Secretariat to expand its staffing and expertise on climate policy—which will require more funding and greater capacity enhancement.



## Annex: Roundtable program

### Climate Change and the Role of ASEAN in Climate Change Politics

Yangon, June 19–20, 2017

#### Monday, June 19

16:00–16:15 **Registration**

16:15–16:30 **Welcome remarks**

- HE U Nyunt Maung Shein, Chairman, Myanmar Institute of Strategic and International Studies (Myanmar ISIS)
- HE Dr AKP Mochtan, Deputy Secretary-General of ASEAN for Community and Corporate Affairs, ASEAN
- Director Professor Ulf Sverdrup, Norwegian Institute of International Affairs (NUPI)

16:30–18:00 **Introductory Presentations**

*Chair: Dr. Daw Kyi Kyi Hla, Senior Member, Myanmar ISIS*

- Climate Change and the Paris Agreement by Mr Nathan Lemphers, University of Toronto and Visiting Research Fellow at NUPI
- Climate change and the Renewable Energy Transition: Implications for International Relations by Professor Indra Overland, Senior Research Fellow and Head of Energy Program, NUPI
- ASEAN and climate change by Mr Ky Anh Nguyen, Director, Sustainable Development Directorate, ASEAN
- Presentation on Mangrove Reforestation in Myanmar by Former Director General U Aye Lwin
- Discussion

18:30–20:30 **Welcome Dinner, with Cultural Entertainment**

(Grand Ballroom Level-2)

#### Tuesday, June 20

**Country Presentations by each ASEAN country, addressing the questions in the Concept Note**

*Chair: Dr Indra Overland, NUPI*

09:00–09:15 Presentation from Cambodia

09:15–09:30 Presentation from Indonesia

09:30–09:45 Presentation from Laos

09:45–10:30 Discussion

10:30–11:00 **Tea Break**

*Chair: Daw Kaythi Soe, Director General of Strategic Studies and Training Department and Secretary of Myanmar ISIS*

11:00–11:15 Presentation from Malaysia

11:15–11:30 Presentation from Myanmar

11:30–11:45 Presentation from the Philippines

11:45–12:30 Discussion

12:30–13:30 **Lunch at the Market Restaurant (Level-2)**

*Chair: H.E. Dr. AKP Mochtan, Deputy Secretary-General of ASEAN for Community and Corporate Affairs, ASEAN*

13:30–13:45 Presentation from Singapore

13:45–14:00 Presentation from Thailand

14:00–14:15 Presentation from Vietnam

14:15–14:30 Discussion

14:30–14:45 **Tea Break**

14:45–15:45 **Discussion: How can ASEAN address the challenges of climate change?**

*Chair: Daw Carole Ann Chit Tha, Member of Myanmar ISIS*

15:45–16:00 **Concluding remarks**

by U Khin Maung Lynn, Joint Secretary-1 Myanmar ISIS and Director Professor Ulf Sverdrup, NUPI

## References

- ADB (2017) *A Region at Risk: The Human Dimensions of Climate Change in Asia and the Pacific*. Manila: Asian Development Bank.
- Ahmed, Tofael; Saad Mekhilef; Shah Rakibuzzaman; N. Mithulananthan; Mehdi Seyedmahmoudian; Ben Horan (2017) "ASEAN Power Grid: A Secure Transmission Infrastructure for Clean and Sustainable Energy for South-East Asia," *Renewable and Sustainable Energy Reviews*, 67(C): 1420–1435.
- Amran, Azlan; Say Keat Ooi; Cheng Yew Wong; Fathyah Hashim (2016) "Business Strategy for Climate Change: An ASEAN Perspective," *Corporate Social Responsibility and Environmental Management*, 23 (4): 213–227.
- Ananta, Aris and Evi Nurvidya Arifin (eds) (2004) *International Migration in Southeast Asia*. Singapore: Institute of Southeast Asian Studies.
- Anderson, Kirsten; Kara Aplant; Maurice Dunaiski; Elizabeth Yarrow (2017) "Women in the Wind: Analysis of Migration, Youth Economic Empowerment and Gender in Vietnam and in the Philippines," <https://plan-international.org/publications/women-in-the-wind>, accessed June 12, 2017.
- Andrews-Speed, Philip (2016) "Connecting ASEAN through the Power Grid: Next Steps," *Energy Studies Institute Policy Brief* 11, <http://esi.nus.edu.sg/docs/default-source/esi-policy-briefs/connecting-asean-through-the-power-grid-next-steps.pdf?sfvrsn=4>, accessed July 27, 2017.
- Arisandi, Yuni (2017) "Indonesia sayangkan as keluar kesepakatan perubahan iklim," <http://www.antaraneWS.com/berita/632803/indonesia-sayangkan-as-keluar-kesepakatan-perubahan-iklim>, accessed June 7, 2017.
- ASEAN (2009) "ASEAN Socio-Cultural Community Blueprint," <http://asean.org/wp-content/uploads/archive/5187-19.pdf>, accessed August 21, 2017.
- ASEAN (2015) "ASEAN Cooperation on Climate Change," <http://environment.asean.org/asean-working-group-on-climate-change/>, accessed June 17, 2017.
- ASEAN (2015) "ASEAN 2025: Forging ahead Together," file:///Users/indraoverland/OneDrive%20-%20NUPI/RUBBISH/ASEAN-2025-Forging-Ahead-Together-final.pdf, accessed October 13, 2017.
- ASEAN ISIS (2017) "The Future of ASEAN: Meeting the Challenges of a Changing Global and Regional Landscape: A Memorandum by the ASEAN Institutes of Strategic and International Studies (ASEAN-ISIS)," February 15, 2017.
- Asian Power* (2013) "China to Invest More in ASEAN Hydropower," *Asian Power*, <http://asian-power.com/regulation/in-focus/china-invest-more-in-asean-hydropower>, accessed July 27, 2017.
- Asian Power* (2013) "China Power Investment Plans US\$17 Billion Indonesian Investments," *Asian Power*, <http://asian-power.com/project/news/china-power-investment-plans-us17-billion-indonesian-investments>, accessed July 27, 2017.
- Astriana, Fina (2015) "ASEAN's Response to Climate Change," *ASEAN Voices*, <https://thcasean.org/read/blog/118/ASEANs-Response-to-Climate-Change>, accessed June 8, 2017.
- Barber, Rebecca (2009) "The Responsibility to Protect the Survivors of Natural Disaster: Cyclone Nargis, a Case Study," *Journal of Conflict Security Law* 14(1): 3–34.
- Biba, Sebastian (2012) "China's Continuous Dam-Building on the Mekong River," *Journal of Contemporary Asia*, 42(4):603–628.
- Biba, Sebastian (2016) "It's Status, Stupid: Explaining the Underlying Core Problem in US–China Relations," *Global Affairs* 2(5): 455–464.
- Bohra-Mishra, Pratikshya; Michael Oppenheimer; Ruohong Cai; Shuaizhang Feng; Rachel Licker (2017) "Climate Variability and Migration in the Philippines," *Population and Environment*, 38(3): 286–308.
- Bose, P.S. (2016) "Vulnerabilities and Displacements: Adaptation and Mitigation to Climate Change as a New Development Mantra," *Area*, 48(2): 168–175.

## References

- Brakenridge, G. R.; J. P. M. Syvitski; E. Niebuhr; I. Overeem; S. A. Higgins; A. J. Kettner; L. Prades (2017) "Design with Nature: Causation and Avoidance of Catastrophic Flooding, Myanmar," *Earth-Science Review*, 165: 81–109.
- Brecht, Henrike; Susmita Dasgupta; Benoit Laplante; Siobhan Murray; David Wheeler (2012) "Sea-Level Rise and Storm Surges: High Stakes for a Small Number of Developing Countries," *The Journal of Environment and Development*, 21(1): 120–138.
- Brouwer, Anne Sjoerd; Machteld van den Broek; Ad Seebregts; André Faaij (2014) "Impacts of Large-Scale Intermittent Renewable Energy Sources on Electricity Systems, and How These Can Be Modeled," *Renewable and Sustainable Energy Reviews*, 33: 443–466.
- Brower, Ralph S.; Francisco Magno; Janet Dilling (2014) "Evolving and Implementing a New Disaster Management Paradigm: The Case of the Philippines," in Naim Kapucu and Kuotsai Tom Liou (eds), *Disaster and Development: Examining Global Issues and Cases*. Springer, pp. 289–313.
- Brzoska, M. and C. Fröhlich (2015) "Climate Change, Migration and Violent Conflict: Vulnerabilities, Pathways and Adaptation Strategies," *Migration and Development*, 5(2): 190–210.
- Buhaug, H.; J. Nordkvelle; T. Bernauer; T. Böhmelt; M. Brzoska; J. W. Busby; A. Ciccone; H. Fjelde; E. Gartzke; N. P. Gleditsch; J. A. Goldstone; H. Hegre; H. Holtermann; V. Koubi; J. S. A. Link; P. M. Link; P. Lujala; J. O'Loughlin; C. Raleigh; J. Scheffran; J. Schilling; T. G. Smith; O. M. Theisen; R. S. J. Tol; H. Urdal; N. von Uexkull (2014) "One Effect to Rule Them All? A Comment on Climate and Conflict," *Climatic Change*, 127(3–4): 391–397.
- Byron, N. (2004) "Managing Smoke: Bridging the Gap between Policy and Research or 'What to Do while it is Raining Outside ...'," *Agriculture Ecosystems & Environment*, 104(1): 57–62.
- Caballero-Anthony, Mely; Teng Paul; Goh Tian; Maxim Shrestha; Jonatan Lassa (2015) *Linking Climate Change Adaptation and Food Security in ASEAN*, ERIA Discussion Paper Series, ERIA-DP-2015-74.
- Caron, David D. (2009) "Climate Change, Sea Level Rise and The Coming Uncertainty in Oceanic Boundaries: A Proposal to Avoid Conflict," in John M. Dyke (ed.), *Maritime Boundary Disputes, Settlement Processes, and the Law of the Sea*. Nijhoff: Brill, pp. 1–18.
- CFO (2013) "Stock Estimate of Overseas Filipinos," Commission on Filipinos Overseas, <http://www.cfo.gov.ph/images/stories/pdf/StockEstimate2013.pdf>, accessed July 24, 2017.
- Chan, Chin Yee; Nhuong Tran; Danh Chi Dao; Timothy Sulser; Michael John Philips; Miroslav Batka; Keith D. Wiebe; Nigel Preston (2017) *Fish to 2050 in the ASEAN Region*. Working Paper 2017–01. [http://pubs.iclarm.net/resource\\_centre/2017-01.pdf](http://pubs.iclarm.net/resource_centre/2017-01.pdf), accessed August 20, 2017.
- Channel News Asia (2017) "US withdrawal from Paris Agreement 'a great pity': Vivian Balakrishnan," *Channel News Asia*, <http://www.channelnewsasia.com/news/singapore/us-withdrawal-from-paris-agreement-a-great-pity-vivian-8906386>, accessed July 24, 2017.
- Chen, Chi-Chung; Bruce McCarl; Ching-Cheng Chang (2012) "Climate Change, Sea Level Rise and Rice: Global Market Implications," *Climatic Change*, 110(3–4): 543–560.
- Climate Change Commission of the Philippines (2017) "CCC Statement on the US Withdrawal From the Paris Agreement," <http://climate.gov.ph/15-press-release/222-ccc-statement-on-the-u-s-withdrawal-from-the-paris-agreement>, accessed July 27, 2017.
- Cotton, J. (1999) "The 'Haze' over Southeast Asia: Challenging the ASEAN Mode of Regional Engagement," *Pacific Affairs*, 72(3): 331–351.
- Di Leva, Charles and Sachiko Morita (2008) "Maritime Rights of Coastal States and Climate Change: Should States Adapt to Submerged Boundaries?" The World Bank, Law and Development Working Paper Series No. 5, [http://siteresources.worldbank.org/INT-LAWJUSTICE/Resources/L&D\\_number5.pdf](http://siteresources.worldbank.org/INT-LAWJUSTICE/Resources/L&D_number5.pdf), accessed July 26, 2017.
- EIA (2017) "Vietnam," <https://www.eia.gov/beta/international/analysis.cfm?iso=VNM>, accessed July 26, 2017.
- Finlayson, Rob (2016) "The Role of Agroforestry in Climate-change Adaptation in Southeast Asia," *World Agroforestry Centre*, <http://blog.worldagroforestry.org/index.php/2016/12/03/role-agroforestry-climate-change-adaptation-southeast-asia/>, accessed July 26, 2017.
- Forsyth, Tim (2014) "Public Concerns about Transboundary Haze: A Comparison of Indonesia, Singapore, and Malaysia," *Global Environmental Change-Human and Policy Dimensions*, 25: 76–86.

## References

- Freedman, Joshua (2016) "Status Insecurity and Temporality in World Politics," *European Journal of International Relations*, 22(4): 797–822.
- Freeman, Bradley C. (2017) "Claims, Frames, and Blame: Coverage of Climate Change in ASEAN's English-Language Newspapers, 2002–2012," *Sage Open*, 7(1): 1–12.
- Goron, Coraline (2014) "EU–ASEAN Relations in the Post-2015 Climate Regime: Exploring Pathways for Top-Down and Bottom-Up Climate Governance," in Wilhelm Hofmeister and Patrick Rueppel (eds), *Climate Change Diplomacy. The Way Forward for Asia and Europe*. Singapore: Konrad Adenauer Stiftung, pp. 101–129.
- Grill, Günther; Camille Ouellet Dallaire; Etienne Fluet Chouinard; Nikolai Sindorf; Bernhard Lehner (2014) "Development of New Indicators to Evaluate River Fragmentation and Flow Regulation at Large Scales: A Case Study for the Mekong River Basin," *Ecological Indicators*, 45: 148–159.
- Grundy-Warr, Carl (2004) "The Silence and Violence of Forced Migration: The Myanmar–Thailand Border," in Aris Ananta and Evi Nurvidya Arifin (eds), *International Migration in Southeast Asia*. Singapore: Institute of Southeast Asian Studies, pp. 228–272.
- The Guardian* (2013a) "Typhoon Haiyan: At least 10,000 reported dead in Philippine province," November 10, <https://www.theguardian.com/world/2013/nov/10/typhoon-haiyan-thousands-dead-philippines>, accessed August 17, 2017.
- The Guardian* (2013b) "China and India 'Water Grab' Dams Put Ecology of Himalayas in Danger," August 10, <https://www.theguardian.com/global-development/2013/aug/10/china-india-water-grab-dams-himalayas-danger>, accessed July 27, 2017.
- Harris, Gardiner (2014) "Borrowed Time on Disappearing Land: Facing Rising Seas, Bangladesh Confronts the Consequences of Climate Change," *New York Times*, <https://www.nytimes.com/2014/03/29/world/asia/facing-rising-seas-bangladesh-confronts-the-consequences-of-climate-change.html>, accessed July 23, 2017.
- Hassan, Muhammad Imzan and Nurul Hanira Rahmat (2016) "The Effect of Coastline Changes to Local Community's Social Economic," *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XL11-4/W1: 25–36.
- Hayakawa, Kazunobu; Toshiyuki Matsuura; Fumihiko Okubo (2015) "Firm-Level Impacts of Natural Disasters on Production Networks: Evidence from a Flood in Thailand," *Journal of the Japanese and International Economies*, 38: 244–259.
- Hilton, Isabel (2013) *China in Myanmar: Implications for the Future*, <https://www.files.ethz.ch/isn/172094/822f00b4d-7da6439a3252789b404f006.pdf>, accessed August 20, 2017.
- Hornoiu, Remus-Ion (2016) "Resilience Capacity of Local Communities from Protected Areas under the Impact of Climate Change and their Strengthening through Ecotourism. The ASEAN Countries' Case," *Quality-Access to Success*, 17(153): 70–73.
- Howe, Brendan and Geehyun Bang (2017) "Nargis and Haiyan: The Politics of Natural Disaster Management in Myanmar and the Philippines," *Asian Studies Review*, 42(1): 58–78.
- Huber, Matthias; Albert Roger; Thomas Hamacher (2015) "Optimizing Long-term Investments for a Sustainable Development of the ASEAN Power System," *Energy*, 88: 180–193.
- IEA (2016) "Key Coal Trends," <https://www.iea.org/publications/freepublications/publication/Key-CoalTrends.pdf>, accessed August 14, 2017.
- ILO (2015) "Migration in ASEAN in figures: The International Labor Migration Statistics (ILMS) Database in ASEAN," *International Labor Organization*, [http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-bangkok/documents/publication/wcms\\_420203.pdf](http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-bangkok/documents/publication/wcms_420203.pdf), accessed July 23, 2017.
- Islam, M. Rezaul and M. Shamsuddoha (2017) "Socio-economic Consequences of Climate Induced Human Displacement and Migration in Bangladesh," *International Sociology*, 32(3): 277–298.
- International Rivers (2013) "Irrawaddy Myitsone Dam," *International Rivers*, <https://www.international-rivers.org/campaigns/irrawaddy-myitsone-dam-0>, accessed July 27, 2017.
- Ives, Mike (2017) "A Chinese-Backed Dam Project Leaves Myanmar in a Bind," *New York Times*, <https://www.nytimes.com/2017/03/31/world/asia/myanmar-china-myitsone-dam-project.html>, accessed July 27, 2017.
- Jevrejeva, S.; J. C. Moore; A. Grinsted (2010) "How Will Sea Level Respond to Changes in Natural and Anthropogenic Forcings by 2100?" *Geophysical Research Letters* 37(7): 1–5.
- Junk, Julian (2016) "Testing Boundaries: Cyclone Nargis in Myanmar and the Scope of R2P," *Global Society*, 78–93.

## References

- Kiik, Laur (2016) "Nationalism and Anti-Ethno-Politics: Why 'Chinese Development' Failed at Myanmar's Myitsone Dam," *Eurasian Geography and Economics*, 57(3):374–402.
- Koh, Kheng-Lian; Ilan Kelman; Robert Kibugi; Eisma Osoria; Rose-Liza (eds) (2015) *Adaptation to Climate Change: ASEAN and Comparative Experiences*. Singapore: Stallion Press.
- Kopplitz, Shannon N.; Daniel J. Jacob; Melissa P. Sulprizio; Lauri Myllyvirta; Colleen Re (2017) "Burden of Disease from Rising Coal-Fired Power Plant Emissions in Southeast Asia," *Environmental Science and Technology*, 51: 1467–1476.
- Kopplitz, Shannon N.; Loretta J. Mickle; Miriam E. Marlier; Jonathan J. Buonocore; Patrick S. Kim; Tianjia Liu; Melissa P. Sulprizio; Ruth S. De Fries; Daniel J. Jacob; Joel Schwartz; Montira Pongsiri; Samuel S. Myers (2016) "Public Health Impacts of the Severe Haze in Equatorial Asia in September–October 2015: Demonstration of a New Framework for Informing Fire Management Strategies to Reduce Downwind Smoke Exposure," *Environmental Research Letters*, 11: 1–10.
- Kreft, Sönke; David Eckstein; Inga Melchior (2016) "Global Climate Risk Index 2017: Who Suffers Most from Extreme Weather Events? Weather-related Loss Events in 2015 and 1996 to 2015," <https://germanwatch.org/de/download/16411.pdf>, accessed June 8, 2017.
- Kuenzer, Claudia; Ian Campbell; Marthe Roch; Patrick Leinenkugel; Vo Quoc Tuan; Stefan Dech (2013) "Understanding the Impact of Hydropower Developments in the Context of Upstream–Downstream Relations in the Mekong River Basin," *Sustainability Science*, 8 (4): 565–584.
- Kumar, Sivanappan; Pujan Shrestha; P. Abdul Salam (2013) "A Review of Biofuel Policies in the Major Biofuel Producing Countries of ASEAN: Production, Targets, Policy Drivers and Impacts," *Renewable & Sustainable Energy Reviews*, 26: 822–836.
- Lassa, Jonatan A.; Allen Yu-Hung Lai; Tian Goh (2015) "Climate Extremes: An Observation and Projection of its Impacts on Food Production in ASEAN," *Natural Hazards*, 84: 19–33.
- Lauber, Volkmar and Staffan Jacobsson (2015) "Lessons from Germany's *Energiewende*," in Jan Fagerberg, Staffan Laestadius and Ben R. Martin (eds), *The Triple Challenge for Europe. Economic Development, Climate Change, and Governance*. Oxford: Oxford University Press, 173–202.
- Lee, Hsiang-He; Rotem Z. Bar-Or; Chien Wang (2017) "Biomass Burning Aerosols and the Low-Visibility Events in Southeast Asia," *Atmospheric Chemistry and Physics*, 17 (2): 965–980.
- Levermann, Anders; Peter U. Clark; Ben Marzeion; Glenn A. Milne; David Pollard; Valentina Radic; Alexander Robinson (2013) "The Multimillennial Sea-Level Commitment of Global Warming," *Proceedings of the National Academy of Sciences*, 110(34): 13745–13750.
- Lidula, N. W. A.; N. Mithulananthan; W. Ongsakul; C. Widjaya; R. Henson (2007) "ASEAN Towards Clean and Sustainable Energy: Potentials, Utilization and Barriers," *Renewable Energy* 32(9): 1441–52.
- Liebman, Alex (2005) "Trickle-down Hegemony? China's 'Peaceful Rise' and Dam Building on the Mekong," *Contemporary Southeast Asia*, 27(2): 281–304.
- Lim, See and Siv Hong (2016) "Cross-Border Labor Migration Surges in Cambodia, Raising Risk of Human Trafficking," <http://asiafoundation.org/2016/12/14/cross-border-labor-migration-surges-cambodia-raising-risk-human-trafficking/>, accessed June 29, 2017.
- Lum, T., and R. Margesson (2014) "Typhoon Haiyan: US and International Response to Philippines Disaster," *Current Politics and Economics of South, Southeastern, and Central Asia*, 23(2): 209–246.
- The Malaysian Insight* (2017) "Putrajaya Regrets US Exit from Paris Accord, Calls it a Setback," *The Malaysian Insight*, [https://www.themalaysianinsight.com/s/4203/?utm\\_source=dlvr.it&utm\\_medium=facebook&utm\\_campaign=the+malaysian+insight](https://www.themalaysianinsight.com/s/4203/?utm_source=dlvr.it&utm_medium=facebook&utm_campaign=the+malaysian+insight), accessed June 22, 2017.
- Mallik, Bishawjit; Bayes Ahmed; Joachim Vogt (2017) "Living with the Risks of Cyclone Disasters in the South-Western Coastal Region of Bangladesh," *Environments*, 4 (1): 1–17.
- Maplecroft (2017) "Climate Vulnerability Index 2017," <http://reliefweb.int/sites/reliefweb.int/files/resources/verisk%20index.pdf>, accessed June 8, 2017.
- McLeod, Elizabeth; Jochen Hinkel; Athanasios Vafeidis; Robert J. Nicholls; Nick Harvey; Rodney Salm (2010) "Sea-Level Rise Vulnerability in the Countries of the Coral Triangle," *Sustainability Science*, 5(2): 207–222.
- McNeely, Jeffrey A. and Songtam Suksawang (2017) "How Conserving Biodiversity Will Help the ASEAN Countries Adapt to Changing Conditions,"

## References

- in Serge Morand, Claire Lajaunie and Rojchai Sattrawaha (eds), *Biodiversity Conservation in Southeast Asia: Challenges in a Changing Environment*. Abingdon: Routledge, pp. 67–93.
- Mekong River Commission (2010) “State of the Basin Report 2010,” <http://www.mrcmekong.org/assets/Publications/basin-reports/MRC-SOB-report-2010full-report.pdf>, accessed July 27, 2017
- Miles, Tom (2015) “Bay of Bengal People-Smuggling Doubles in 2015: UNHCR,” <https://www.reuters.com/article/us-thailand-rohingya-unhcr-idUSKBN0NT11D20150508>, accessed July 26, 2017.
- Mosuella, Cleovi and Denise Margaret Matias (2015) “The Role of A Priori Cross-Border Migration after Extreme Climate Events: The Case of the Philippines after Typhoon Haiyan,” in Felicitas Hillmann, Marie Pahl, Birte Rafflenbeul and Harald Sterly (eds), *Environmental Change, Adaptation and Migration. Bringing in the Region*. London: Palgrave Macmillan, pp. 98–116.
- National Climate Change Secretariat Singapore (2017) “Impact of Climate Change on Singapore,” <https://www.nccs.gov.sg/climate-change-and-singapore/national-circumstances/impact-climate-change-singapore>, accessed July 26, 2017.
- Nazeer, Nazia and Fumitaka Furuoka (2017) “Overview of ASEAN Environment, boundary Haze Pollution Agreement and Public Health,” *International Journal of Asia Pacific Studies*, 13 (1): 73–94.
- Nesadurai, Helen E. S. (2017) “ASEAN Environmental Cooperation, national Private Governance, and the Haze: Overcoming the ‘Territorial Trap’ of State-Based Governance?” *TRaNS: Trans-Regional and National Studies of Southeast Asia*, 5 (1): 121–145.
- Nethery, Amy (2014) “Australia, ASEAN, and Forced Migration in Asia,” in Sally Percival Wood and Baogang He (eds) *The Australia-ASEAN Dialogue*. Palgrave Macmillan, pp. 107–124.
- Neumann, Barbara; Athanasios T. Vafeidis; Juliane Zimmermann; Robert J. Nicholls (2015) “Future Coastal Population Growth and Exposure to Sea-Level Rise and Coastal Flooding: A Global Assessment,” *PLoS One* 10(3).
- Ng, Kexian (2017) “boundary Haze Pollution in Southeast Asia: The Effectiveness of Three Forms of International Legal Solutions,” *Journal of East Asia and International Law*, 10 (1): 221–244.
- Ng, W.-S. and R. Mendelsohn (2005) “The Impact of Sea Level Rise on Singapore,” *Environment and Development Economics* 10: 201–215.
- Nguitragool, Paruedee (2002) “Negotiating the Haze Treaty Rationality and Institutions in the Negotiations for the ASEAN Agreement on boundary Haze Pollution,” *Asian Survey*, 51 (2): 356–378.
- NSIDC (2017) “Quick Facts on Ice Sheets,” <https://nsidc.org/cryosphere/quickfacts/icesheets.html>, accessed July 25, 2017.
- Nurhidayah, Laely; Shawkat Alam; Zada Lipman (2015) “The Influence of International Law upon ASEAN Approaches in Addressing Transboundary Haze Pollution in Southeast Asia,” *Contemporary Southeast Asia*, 37 (2): 183–210.
- Odihi, J.O. (2001) “Haze and Health in Brunei Darussalam: The Case of the 1997–98 Episodes,” *Singapore Journal of Tropical Geography*, 22 (1): 38–51.
- ONEP Thailand (2017) “Statement in response to queries on the US withdrawal from the Paris Agreement,” *ONEP Thailand*, <http://climate.onep.go.th/english-statement-in-response-to-queries-on-the-us-withdrawal-from-the-paris-agreement/?lang=en>, accessed July 25, 2017.
- Osada, Jasmine (2015) “Singapore Can’t Accept Refugees: MHA,” *The Straits Times*, <http://www.straitstimes.com/singapore/singapore-cant-accept-refugees-mha>, accessed July 25, 2017.
- O’Sullivan, Meghan; Indra Overland; David Sandalow; Arno Behrens; Neil Bhatiya; Alex Clark; Tobias Cremer; Jonathan Elkind; Micah Fessler; Nathan Lemphers; Melanie Nakagawa; Magdalena Seol; Can Soylu; Roman Vakulchuk (2017) “The Geopolitics of Renewable Energy,” Columbia University, Harvard University, and NUPI, <https://www.belfercenter.org/sites/default/files/files/publication/Geopolitics%20Renewables%20-%20final%20report%206.26.17.pdf>, accessed August 26, 2017.
- Othman, L. (2015) “Concerted global effort needed to resolve climate change issue: Balakrishnan,” <http://www.channelnewsasia.com/news/singapore/concerted-global-effort-needed-to-resolve-climate-change-issue-b-8246292>, accessed July 25, 2017.
- Overland, Indra (2015) “Future Petroleum Geopolitics: Consequences of Climate Policy and Unconventional Oil and Gas,” in Jinyue Yan (ed.), *Handbook of Clean Energy Systems*, Chichester: Wiley, pp. 3517–3544.
- Paul, Bimal and Harun Rashid (2016) *Climatic Hazards in Coastal Bangladesh: Non-Structural and Structural Solutions*. Oxford: Butterworth-Heinemann.

## References

- Petcharamesree, Sriprapha (2016) "ASEAN and its Approach to Forced Migration Issues," *International Journal of Human Rights*, 20 (2): 173–190.
- Pickford, Andrew (2017) "The Transformation of ASEAN: Energy Security Implications," [http://perthusasia.edu.au/PerthUSAsia/media/Perth\\_USAsia/PUAC-Energy-Security-Vol2-ASEAN.pdf](http://perthusasia.edu.au/PerthUSAsia/media/Perth_USAsia/PUAC-Energy-Security-Vol2-ASEAN.pdf), accessed July 26, 2017.
- Rahman, M. H.; M. A. Noor; A. Ahmed (2011) "Climate Change Impacts and Adaptation Strategies for Bangladesh," in M. Hossain and E. Selvanathan (eds), *Climate Change and Growth in Asia*. Cheltenham: Edward Elgar, pp. 129–146.
- Rajan, S. C. (2008) *Climate Migrants in South Asia: Estimates and Solutions*. Greenpeace India.
- Rasiah, Rajah; Adeel Ahmed; Abul Quasem Al-Amin; Santha Chenayah (2017) "Climate Change Mitigation: Comparative Assessment of Malaysian and ASEAN Scenarios," *Environmental Science and Pollution Research*, 24 (3): 2632–2642.
- Reilly, James (2013) "China and Japan in Myanmar: Aid, Natural Resources and Influence," *Asian Studies Review*, 37(2): 141–157.
- Renn, Ortwin and Jonathan Paul Marshall (2016) "Coal, Nuclear and Renewable Energy Policies in Germany: From the 1950s to the 'Energiewende'," *Energy Policy*, 99: 224–232.
- Roy, Anjan Kumer Dev (2017) "An Investigation into the Major Environment and Climate Change Policy Issues in Southwest Coastal Bangladesh," *International Journal of Climate Change Strategies and Management*, 9 (1): 123–136.
- Ruamsuke, Kawin; Shobhakar Dhakar; Charles Marpaung (2015) "Energy and Economic Impacts of the Global Climate Change Policy on Southeast Asian Countries: A General Equilibrium Analysis," *Energy*, 81: 446–461.
- Ruppel, Oliver (2015) "Climate Change, Law and Development in Africa: A Reflection on Selected Aspects, Relations and Responses," in Hans-Joachim Koch, Doris König, Joachim Sanden, Roda Verheyen (eds), *Legal Regimes for Environmental Protection: Governance for Climate Change*. Leiden: Brill, pp. 89–117.
- Rutten, Martine; Michiel van Dijk; Wilbert van Rooij; Henk Hilderink (2014) "Land Use Dynamics, Climate Change, and Food Security in Vietnam: A Global-to-Local Modeling Approach," *World Development*, 59: 29–46.
- Sabuti, Asnor Azrin and Che Abd Rahim Mohamed (2016) "Impact of Northern and Southern Air Mass Transport on the Temporal Distribution of Atmospheric Po-210 and Pb-210 in the East Coast of Johor, Malaysia," *Environmental Science and Pollution Research*, 23 (18): 18451–18465.
- Saha, Sebak Kumar (2017) "Cyclone Aila, Livelihood Stress, and Migration: Empirical Evidence from Coastal Bangladesh," *Disasters*, 41 (3): 505–526.
- Sahraie, Mélodie (2011) *The ASEAN Actions on Climate Change: Recognizing or Pro-Actively Addressing the Issue?* Sustainable Development Law on Climate Change Working Paper Series. International Development Law Organization (IDLO) and the Center for International Sustainable Development Law, [http://cisdl.org/public/docs/news/5.\\_Melodie\\_Sahraie\\_2.pdf](http://cisdl.org/public/docs/news/5._Melodie_Sahraie_2.pdf), accessed August 19, 2017.
- Salamanca, Albert and Ha Nguyen (2016) *Climate Change Adaptation Readiness in the ASEAN Countries*. Discussion Brief, Stockholm Environment Institute (SEI) – Asia, <https://www.sei-international.org/mediamanager/documents/Publications/Climate/SEI-DB-2016-Climate-adaptation-readiness-ASEAN.pdf>, accessed August 18, 2017.
- Seekins, Donald M. (2009) "State, Society and Natural Disaster: Cyclone Nargis in Myanmar," *Asian Journal of Social Science*, 37(5): 717–737.
- Selth, Andrew (2008) "Even Paranoids Have Enemies: Cyclone Nargis and Myanmar's Fears of Invasion," *Contemporary Southeast Asia* 30(3): 379–402.
- Shadman, F.; S. Sadeghipour; M. Moghavvemi; R. Saidur (2016) "Drought and Energy Security in Key ASEAN Countries," *Renewable & Sustainable Energy Reviews*, 53: 50–58.
- Shannon, Stephanie and Nicholas Farrelly (2014) "Whither China's Myanmar Stranglehold?" in Ooi Kee Beng (ed.), *Selections 2012–2013*, ISEAS Publishing, 26–36.
- Sovacool, Benjamin K. (2009) "Reassessing Energy Security and the Trans-ASEAN Natural Gas Pipeline Network in Southeast Asia," *Pacific Affairs*, 82 (3): 467–486.
- Statista (2017) "Major Liquefied Natural Gas Exporting Countries in 2016," <https://www.statista.com/statistics/274528/major-exporting-countries-of-lng/>, accessed July 27, 2017.
- Stockholm Environment Institute (2016) *Climate Change Adaptation Readiness in the ASEAN Countries*. Discussion Brief, Stockholm Environment Institute (SEI) – Asia, <https://www.sei-international.org/mediamanager/documents/Publications/Climate/SEI-DB-2016-Climate-adaptation-readiness-ASEAN.pdf>, accessed August 18, 2017.

## References

- al.org/mediamanager/documents/Publications/Climate/SEI-DB-2016-Climate-adaptation-readiness-ASEAN.pdf, accessed August 20, 2017.
- Stojanov, Robert; Ilan Kelman; A. K. M. Ahsan Ullah; Barbora Duzi; David Prochazka; Klara Blahutova Kavanova (2016) "Local Expert Perceptions of Migration as a Climate Change Adaptation in Bangladesh," *Sustainability*, 8 (12): 1–15.
- Suberu, Mohammed Yekini; Mohd Wazir Mustafa; Nouruddeen Bashir (2014) "Energy Storage Systems for Renewable Energy Power Sector Integration and Mitigation of Intermittency," *Renewable and Sustainable Energy Reviews*, 35: 499–514. *The Sun Daily* (2017) "Malaysia Confident US Withdrawal will not Affect Paris Agreement on Climate Change: Wan Junaidi," *The Sun Daily*, <http://www.thesundaily.my/news/2017/06/04/malaysia-confident-us-withdrawal-will-not-affect-paris-agreement-climate-change-wan->, accessed July 27, 2017.
- Sun, Yun (2012) "China's Strategic Misjudgment on Myanmar," *Journal of Current Southeast Asian Affairs*, 31(1): 73–96.
- Syed, F. S.; Waheed Iqbal; Ahsan Ali Bukhari Syed; G. Rasul (2014) "Uncertainties in the Regional Climate Models Simulations of South-Asian Summer Monsoon and Climate Change," *Climate Dynamics*, 42 (7–8): 2079–2097.
- Tacconi, Luca; Frank Jotzo; R. Quentin Grafton (2008) "Local Causes, Regional Co-operation and Global Financing for Environmental Problems: The Case of Southeast Asian Haze Pollution," *International Environmental Agreements-Politics Law and Economics*, 8 (1): 1–16.
- Tang, F. X. (2017) "As Sea Levels Rise, Singapore Prepares to Stem the Tide," *The Straits Times*, <http://www.straitstimes.com/singapore/as-sea-levels-rise-singapore-prepares-to-stem-the-tide>, accessed July 27, 2017.
- Thng, M. (2015) "Does Singapore Have a Reason to Refuse Refugees?" *Singapore Policy Journal*, <https://singaporepolicyjournal.com/2015/05/21/does-singapore-have-a-reason-to-refuse-refugees/>, accessed July 27, 2017.
- Thompson, J.R.; A.J. Green; D.G. Kingston (2014) "Potential Evapotranspiration-Related Uncertainty in Climate Change Impacts on River Flow: An Assessment for the Mekong River Basin," *Journal of Hydrology*, 510, 259–279.
- Today Online* (2015) "The Big Read: Consumers, NGOs take up fight against haze but it is a long trudge," October 3, <http://www.todayonline.com/singapore/big-read-consumers-ngos-take-fight-against-haze-it-long-trudge>, accessed August 17, 2017.
- Treat, Jason; Matthew Twombly; Web Barr; Maggie Smith; Kees Veenenbros (2013) "What the World Would Look Like if All the Ice Melted," *National Geographic*, <http://www.nationalgeographic.com/magazine/2013/09/rising-seas-ice-melt-new-shoreline-maps/>, accessed July 26, 2017.
- Ulvestad, Marte and Indra Overland (2011) "Natural Gas and CO2 Price Variation: Impact on the Relative Cost-efficiency of LNG and Pipelines," *International Journal of Environmental Studies*, 69(3): 407–426.
- UNFCCC (2017a) "Status of Ratification of the Kyoto Protocol," [http://unfccc.int/kyoto\\_protocol/status\\_of\\_ratification/items/2613.php](http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php), accessed July 13, 2017.
- UNFCCC (2017b) "Paris Agreement - Status of Ratification," [http://unfccc.int/paris\\_agreement/items/9444.php](http://unfccc.int/paris_agreement/items/9444.php), accessed July 13, 2017.
- UNTC (2017) "Depositary Notifications (CNs) by the Secretary-General," [https://treaties.un.org/Pages/CNs.aspx?cnTab=tab1&clang=\\_en](https://treaties.un.org/Pages/CNs.aspx?cnTab=tab1&clang=_en), accessed July 13, 2017.
- Urban, Frauke; Johan Nordensvärd; Deepika Khatri; and Yu Wang (2013) "An Analysis of China's Investment in the Hydropower Sector in the Greater Mekong Sub-Region," *Environment, Development and Sustainability*, 15(2): 301–324.
- Van den Broeke, Michiel R.; Elyn M. Enderlin; Ian M. Howat; Peter Kuipers Munneke; Brice P. Y. Noël; Willem Jan van de Berg; Erik van Meijgaard; Bert Wouters (2016) "On the Recent Contribution of the Greenland Ice Sheet to Sea Level Change," *The Cryosphere*, 10: 1933–1946.
- Varkkey, Helena (2014) "Regional Cooperation, Patronage and the ASEAN Agreement on Transboundary Haze Pollution," *International Environmental Agreements: Politics, Law and Economics*, 14 (1): 65–81.
- Vehmas, Jarmo; Jyrki Luukkanen; Jari Kaivo-oja; Juha Panula-Ontto; Francesca Allievi (2012) *Key Trends of Climate Change in the ASEAN Countries. The IPAT Decomposition Analysis 1980–2005*. [https://www.utu.fi/fi/yksikot/ffrc/julkaisut/e-tutu/Documents/eBook\\_2012-5.pdf](https://www.utu.fi/fi/yksikot/ffrc/julkaisut/e-tutu/Documents/eBook_2012-5.pdf), accessed August 20, 2017.
- Vermeer, Martin and Stefan Rahmstorf (2009) "Global Sea Level Linked to Global Temperature," *Proceedings of the National Academy of Sciences of America*, 106(51): 21527–21532.



## References

- Vidas, Davor (2014) "Sea-Level Rise and International Law: At the Convergence of Two Epochs," *Climate Law*, 4: 70–84.
- Vinke, Kira; Hans Joachim Schellnhuber; Dim Coumou; Tobias Geiger; Nicole Glanemann; Veronika Huber; Maria Knaus; Jürgen Kropp; Steffen Kriewald; Benoit Laplante; Jascha Lehmann; Anders Levermann; Anastasia Lobanova; Xianfu Lu; Christian Otto; Christopher Reyer; Alexander Robinson; Charles Rodgers; Diego Rybski; Jacob Schewe; Sven Willner; Michel Wortmann; Fang Zhao; Bin Zhou (2017) *A Region at Risk: The Human Dimensions of Climate Change in Asia and the Pacific*, <https://www.adb.org/sites/default/files/publication/325251/region-risk-climate-change.pdf>, accessed October 11, 2017.
- VornDick, Wilson T. (2012) "Thanks Climate Change: Sea-Level Rise Could End South China Sea Spat," *The Diplomat*, <http://thediplomat.com/2012/11/can-climate-change-wash-away-south-china-sea-dispute/>, accessed July 20, 2017.
- Wade, Geoff (2011) "ASEAN Divides," in Michael J. Montesano and Lee Poh Onn (eds), *Regional Outlook: Southeast Asia 2011–2012*. Singapore: ISEAS Publishing.
- Workman, Daniel (2017) "Coal Exports by Country," <http://www.worldstopexports.com/coal-exports-country/>, accessed July 27, 2017.
- World Bank (2014) "Energy Imports, Net," <http://data.worldbank.org/indicator/EG.IMP.CON.S.ZS>, accessed August 11, 2017.
- World Bank (2016) "Migration and Remittances Factbook 2016," <https://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1199807908806/4549025-1450455807487/Factbookpart1.pdf>, accessed August 11, 2017.
- World Bank (2017) "Intended Nationally Determined Contributions," [http://spappssecext.worldbank.org/sites/indc/Pages/Content\\_Brief.aspx](http://spappssecext.worldbank.org/sites/indc/Pages/Content_Brief.aspx), accessed August 13, 2017.
- Wright, Stephen (2016) "Laos' Thirst for Mekong River Dams Imperils Fishing, Farming," *San Diego Union Tribune*, <http://www.sandiegouniontribune.com/sdut-laos-thirst-for-mekong-river-dams-imperils-2016aug07-story.html>, accessed 27 July 2017
- WWF (2013) *Singapore's Haze Underscores Need for Action Against Irresponsible Companies*, <http://www.wwf.sg/?209155/singapore-haze-underscores-need-for-action-against-irresponsible-companies>, accessed August 17, 2017.
- Yong, Ding Li and Kelvin S.-H. Peh (2016) "South-East Asia's Forest Fires: Blazing the Policy Trail," *ORYX*, 50 (2): 207–212.
- Zulkifli, M. (2017). "#Masagos disappointed that the US has announced its withdrawal from the Paris Agreement," [Facebook status update] <https://www.facebook.com/masagos/posts/753198464841173>, accessed June 2, 2017.

