



Climate Change and Security

Two Scenarios for South East Asia

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Executive Summary

The major challenge of climate change in South East Asia (SEA) will be increased unpredictability. Regional warming, glacier melt, changing precipitation patterns, salt water intrusion and reach of extreme weather events due to sea-level rise (SLR) will lead to increased climate variability outside of known boundaries. Changes over the years could significantly increase droughts, followed by heavy rains and floods. While SEA is relatively abundant in natural resources, variability and unpredictability could still result in unexpected crises. Despite a major food exporter, the 2008 food crisis hit the region unexpectedly hard, resulting in violent riots in several countries. Climate change would make such a **crisis not only more likely, but also more unpredictable.**

Concurrently, rapid population growths, economic development in coastal areas and increasing resource and energy demands **exacerbate vulnerabilities.** Among others, ten or more nuclear power plants are planned to start operating in 2020 and beyond. A single crisis could thus have a far **greater impact than before.** This can **bind regional and international humanitarian resources** needed elsewhere. Also, SEA's role as a **food exporter, and transport and economic hub** means that a major regional crisis may have international repercussions.

The region suffers from a number of unresolved armed conflicts. This includes Myanmar, southern Thailand, northern and southern Philippines, and several areas in Indonesia. **Armed conflicts limit adaptation capacities** and may become further marginalised due to climate change. This can make subsequent reconstruction efforts more difficult,



South East Asia

especially in **the South China Sea.** Today, disputes over the maritime borders already exist. Under SLR, maritime borders may become even more blurred and tensions more difficult to resolve.

Improving climate resilience should be the main focus of action to counter these developments. This will particularly require **additional research on regional climate variability,** and to develop and improve **early warning capacities** for short-term impacts. Emphasis should be laid on conducting **'no-regrets' measures** and **empowering local communities.** Finally, **regional organisations need to address climate change to develop response capacities and initiate dialogue** on emerging issues such as SLR impacts on maritime borders.

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List of Abbreviations

ADB	Asian Development Bank
AR4	IPCC 4th Assessment Report
ARF	ASEAN Regional Forum
ASEAN	Association of South East Asian Nations
CCIS	Climate Change and International Security
CSCAP	Council for Security Cooperation in the Asia Pacific
EC	European Commission
ENSO	El Niño Southern Oscillation
EU	European Union
GAERC	EU General Affairs and External Relations Council
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
IOM	International Organization for Migration
IPCC	Intergovernmental Panel on Climate Change
NGO	Non-Governmental Organization
OCHA	UN Office for the Coordination of Humanitarian Affairs
SLR	Sea-level rise
START	System for Analysis, Research and Training
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commissioner for Refugees
UNSC	UN Security Council
UNSG	UN Secretary General

1. Introduction

Climate change is likely to be among the key challenges for international security and stability in the 21st century (EU 2008). The European Union (EU) initiated the EU Process on Climate Change and International Security (CCIS) in response to climate threats. The process commenced with the Joint Paper by High-Representative Solana and Commissioner Ferrero-Waldner in March 2008 (EU 2008a). A progress report was submitted by the European Commission (EC) and the Council Secretariat (SEC) to the General Affairs and External Relations Council (GAERC) in December 2009. Additionally, the United Nations (UN)

As part of EU process, a synopsis of findings of regional studies on climate change and security was produced (Maas/Tänzler 2009). Within the scope of the study, four regions were identified, which have been less researched so far. Based on the synopsis, four additional studies were commissioned by the EC. The purpose of the studies is (1) to provide an overview to the region and likely climate change impacts; (2) outline potential security implications of climate change; and (3) to develop recommendations for the EU's foreign, security and development policy.

The regions are Middle America, South East Asia, South West Asia and the Indian-Pacific Ocean Island States' region. **This study focuses on South East Asia**, which is defined as the region ranging from Myanmar, Burma in the west to Indonesia in the east, including also Thailand, Laos, Vietnam, Cambodia, Malaysia, Singapore, Brunei Darussalam and the Philippines.

The study focus on the region as a whole; individual countries and sub-national regions will be examined where appropriate. A common structure was defined for all regional studies. It is as follows:

- **Section 1** provides an executive summary on major findings and recommendations.
- **Section 2** provides a regional overview to the region. It will briefly discuss issues of demography and migration, key economic challenges, as well as outline main lines of political and social instability and conflicts in the region.
- **Section 3** summarises the key impacts of climate change on the region.
- **Section 4** outlines potential conflict constellations and scenarios, how climate change may lead to insecurity and instability. These constellations are plausible, yet hypothetical and are based on literature review and expert assessment; more research is needed to improve validity.
- **Section 5** outlines how different stakeholders have already begun to cope with the challenges of climate change for security. The section concludes with recommendations to the EU.

Security is broadly defined in this study. Climate change is best viewed as a threat multiplier, which may create or exacerbate insecurities and tensions from the individual to the international level (EU 2008a). There are a variety of studies categorising and analysing the different channels, pathways and linkages between climate change and insecurity.¹ A key difficulty is the use of the term 'security': Depending on its context and use, it may denote 'hard' (political/military conflicts) or 'soft' (access to food and water) issues. Climate change may impact 'hard' and 'soft' dimensions of security. Also, impacts on one dimension, such as food insecurity, may also have impacts on the other dimension, such as via food riots (cf. Carius et al. 2008). Thus, 'security' is broadly defined within the scope of the studies below. In particular, we will focus on the following aspects:

- **Contributing to violent conflict and disputes** from the local to the international level.
- **Leading to state fragility**, radicalisation and degrading state capacities to implement policies.
- **Degrading human security and livelihoods** via increased risks of disasters, food insecurity, energy poverty and the like.

Regarding climate change impacts, there is emerging consensus that climate change impacts will be far more drastic than assessed in the 4th Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC). For instance, sea-level rise (SLR) is likely to be twice as high as estimated by the IPCC (Richardson et al. 2009). Also, limiting global warming to 2°C, as intended by the EU

¹ For a more in-depth discussion on interlinkages between climate change and different definitions of security, see Carius et al. 2008, WBGU 2007, Brown 2009, Smith/Vivikanda 2009, EU 2008.

and many other states, is already no longer possible: It would require emission cuts within the next decade unlikely to be achieved (Fetzek 2009: 2). Instead, global warming of 4°C (with strong regional variations) by end of the century is currently becoming a more likely scenario (Richardson et al. 2009; Allison et al. 2009). However, a strong uncertainty remains when and how concrete impacts of climate change will manifest. Thus, the studies will focus on the general climate trends already observable within the regions. They will span the period from the present day to 2050 as social, economic and environmental trend estimates are comparatively accurate for this time period, compared with 2050-2100 (cf. Lee 2009). **Methodologically, the studies are based on** desk-based research, interviews with experts and technical workshops held in Bangkok (Thailand) on September

3; Suva (Fiji) on September 10; Quito (Ecuador) on November 4; and Beirut (Lebanon) on November 18. **38 working days have been allocated for each study including research, travel, workshop facilitation and report writing.** Due to regional specificities, the studies slightly vary with regard to their structure and approach.

The studies do not aim to be comprehensive. Analysing potential future developments is always speculative to some degree. The scenarios are thus assumptions about likely relationships between climate change trends and the current regional context. Hence, this study provides an overview to key emerging issues related to climate change and security. More research will be needed to identify concrete national and sub-national hot spots and develop tailored recommendations.

2. Politics, Society, Economy and Environment

South East Asia is economically **strongly dependent on its renewable natural resources**. Agriculture, forestry and tourism are key economic sectors. However, resource use is often unsustainable. The countries are **highly diverse politically and economically**, with some being food exporters and others dependent on food imports, while others are economically advanced or have low levels of human development. Several countries are politically volatile with some facing armed insurgencies. **Population growth is above the global average** and likely to add another 160 million until 2050. **Intra- and international migration numbers register today in the millions** and will likely increase in the future as demands for labour escalates. The region suffers from **energy shortages**. Besides additional damming of the Mekong region, up to ten nuclear power plants are planned or are being considered, and could be operational by 2020+ to meet rising energy challenges.

South East Asia is in many aspects a highly diverse region. It has several politically stable and economically advanced countries such as Singapore and Brunei Darussalam. Simultaneously, the region is **home to multiple domestic armed conflicts, political instability and international disputes**, which continue to be sources of instability. Thailand has long been stable, but has suffered from political volatility and crises since 2006. The country remains polarised between different political groups and faces an armed insurgency striving for independence in its deep south (ICG 2009; 2008). Bangkok serves as a critical hub for the region. For example, when protests shut down Bangkok's international airport this affected the tourism and business sectors across the region (NYT 2008).

Indonesia and the Philippines each face multiple domestic armed conflicts, variously aiming at

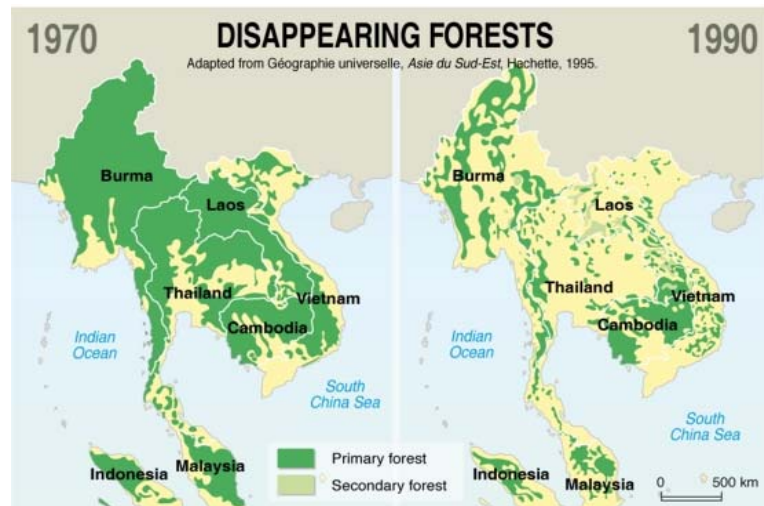
secession or toppling the central governments (HIIK 2008). In addition, Indonesia has suffered numerous terrorist attacks in the past few years. Burma/Myanmar which is considered a failed state (FfP 2009), has gone through several domestic conflicts as well (HIIK 2008). Regarding maritime borders and territory: low-level international disputes continue between littoral states of the South China Sea, which is a key shipping route and rich in fossil fuels (HIIK 2008; cf. Paskal 2007).

Violent conflicts remain low-level and localised. Also, international violent conflict is notably absent from the region. Countries practice **non-interference** in domestic affairs. With the Association of South East Asian Nations (ASEAN), a regional organisation and forum for coordination exists. SEA is also a **nuclear weapon free zone** through the treaty of Bangkok (OPANAL 2009). However, disasters as well as the

global food, energy and economic crisis revealed vulnerabilities of countries and limitations of regional organisations (Job/Williams 2008). Cyclone Nargis, which resulted in tens of thousands of people dying or missing, exceeded the capacity of any state in the region (Ibid.). Disasters can interface also local conflicts as the Indian Ocean Tsunami proved in 2004, even if (or because) extra-regional humanitarian aid is delivered: In case of Sri Lanka, the delivery of aid was perceived as inequitable (Chafé/Renner 2007) and fuelled tensions between the conflict parties. However, in Indonesia, cooperation in the face of emergency supported defusing tensions in the Aceh Conflict (Ibid.). Thus, it is of utmost importance in times of crises to prudently deliver aid to prevent fuelling conflict (see Anderson 1999).

Despite SEA's large **food exports**, the global food crisis resulted in violent protests and riots (Grebmer et al. 2008) in the region. Several countries such as Cambodia and Vietnam temporarily banned exports, which produced negative repercussions for the food importing countries such as the Philippines, but also the exporting countries. Without export markets, an excessive supply of domestic food products ruined prices and led to severe income losses for farmers and traders (cf. Williams and Anthony 2008). While the region thrives on its integration into global markets and trade routes, these events also highlighted their dependency and vulnerability to global crises.

Economically, the region is highly diverse, yet strongly dependent on its natural resources. Tourism, agriculture and the export of timber products as well as insurance and finance, transport and logistics, dominate the top economic sectors. The region has been among the fastest and most dynamically growing in the world. SEA's abundant renewable natural resources are among its key assets and source of much of its growth in recent decades (ADB 200). However, the differences between countries are significant. Countries such as Singapore and Brunei Darussalam have high per capita gross domestic products (GDP) with large service and very small agricultural sectors. In others,



Map 1: Disappearing Forests.
Source: UNEP 2009

such as Burma/Myanmar, Vietnam, Laos, Indonesia and Cambodia, between 40 and 80 per cent of the workforce are employed in the agricultural sector. Many of them are practicing subsistence farming. A third of the population live below the poverty line (see table 2), many of whom are farmers. Global demand for agricultural products – food, biofuels, etc. – soared in recent years, which caused greater strain on the land.

As a result, **environmental degradation** in the region has accelerated, causing negative impacts on biodiversity and ecosystems as well as significant loss of forest cover (ADB 2009, see also map 7). Concurrently, water use for irrigation has escalated across the region as well. In recent years, dry spells resulting from the El Niño Southern Oscillation (ENSO) led to forest fires accelerating the destruction of primary forests (Ibid.). The recent upsurge in the global demand for biofuels resulted in destruction of rainforests and land disputes in Indonesia (Oxfam 2007, 2008). Ongoing deforestation and excessive use of water rapidly depletes water levels and groundwater aquifers (ADB 2009).

Demographically, SEA's population will continue to grow by approximately one-third until 2050, adding over 160 million people. The countries are ethnically and religiously heterogeneous. Migration is common in the region and there are several million seasonal or permanent migrants within and across countries to find employment and income. In the ASEAN region, an estimated 5.4 million international migrants exist (IOM 2008). Among major receiving

countries are those economically advanced, particularly Thailand (receiving from Laos, Cambodia and Burma/Myanmar) and Malaysia (receiving from Indonesia, the Philippines and Burma/Myanmar) (Ibid.).

Due to population and economic growth, **resource demands increase as well**. It is possible that SEA will transform from a current food exporting region to a food importing region over the next few decades if present trends of rising populations continue and agricultural output decreases substantially.²

Energy demands are increasing as well, with hydropower representing a large share on continental SEA. In addition, plans for possibly up to **ten or more nuclear power plants** have been developed to address the region's energy crisis (Ta 2008). In a more recent development, ASEAN and Gulf Cooperation Council (GCC) discussed an "oil-for-food" programme, i.e. that ASEAN countries deliver food to GCC countries which will in turn deliver oil to ASEAN countries (Kumetat 2009).

Country	Estimated Population 2010 (thousands)	Estimated Population 2050 (thousands)	Population below poverty line (%)	Employment in agricultural Sector (%)	GDP per capita 2007 (US \$)
Burma/ Myanmar	50,496	63,373	32.7	70	no data
Brunei	407	658	NA	4.5	53,300
Cambodia	15,053	23,795	35.0	75	578
Indonesia	232,517	288,110	17.8	42.1	1,918
Laos	6,436	10,744	30.7	80	701
Malaysia	27,914	39,664	5.1	13	7,033
Philippines	93,617	146,165	30.0	35	1,639
Singapore	4,837	5,221	NA	0	35,163
Thailand	68,139	73,361	10.0	42.6	3,844
Viet Nam	89,029	111,666	14.8	55.6	806

Table 1: Selected Population and Economic Data for South East Asia. Sources: UNDP 2009; UNPD 2009; CIA 2009. Population estimates are median variant.

² Interview with researcher, Bangkok University, 4 September 2009.

3. Climate Change Trends and Impacts

Little reliable data is available on the concrete regional, national and local impacts of climate change in the region. Due to its abundant renewable natural resources, the **impact will be less pronounced** than in other regions such as Central Asia or the Middle East. However, **climate variability** is likely to increase and become a major challenge due to its associated **unpredictability**. As ecosystems and many environmentally dependent economic sectors such as agriculture, tourism and forestry are accustomed to relatively stable seasons, sudden changes could produce significant consequences. Instead of gradual deterioration, the challenge will be to cope with **sudden crises**, which could lead to humanitarian crises, food insecurity and similar events. Current adaptation efforts are mostly technical and do not capture this complexity. Also, current policies may contradict such action and could further exacerbate impacts of climate change.

South East Asia will experience at the regional level the same trends as globally: **increased average warming** and sea-level rise, although both are likely not to exceed above global averages in contrast to areas such as the Middle East (cf. ADB 2009). Both will have a number of gradual impacts: warming, on the one hand, increases demands for cooling and leads to higher evaporation rates of river and surface waters, while it will on the other hand negatively affect agricultural production, particularly the production of rice: It is estimated, that 1°C of warming will lead to a 10 percent drop of rice production (cf. ADB 2009). Warming will also facilitate the transmission of diseases. Increased glacial melt at the Himalaya will likely increase the flows of the Mekong River, thus countering to some degree higher rates of evaporation. However, seasons will be more pronounced, with up to a third more (in wet seasons) or less (in dry seasons) water (cf. ADB 2009).

Concurrently, it also increases the risks of more severe flooding. However, wet and dry seasons are likely to become more pronounced, hence, hydropower generation may fall during dry and hot seasons when cooling demands are greatest. As SEA is highly dependent on its natural resources, the Asian Development Bank estimated that climate-induced economic loss could equal 6.7 percent of the regions gross domestic product (GDP). Thus, the **economic impact of climate change would be three times above the estimated global average of climate-induced economic loss** (ADB 2009).

Sea-level rise, especially if recent predictions (Richardson et al. 2009; Allison et al. 2009) of 50cm and above by 2050 hold true, will substantially

increase salt-water intrusion and ground water salinisation. This will affect the fertile Mekong delta and the large island states – Indonesia and the Philippines. It could accelerate the reduction of food production in continental SEA, especially Vietnam and continuously raise questions for maritime borders in the South China Sea. It would also negatively affect coastal cities such as Bangkok or Java, which are sinking due to land subsidence and groundwater extraction. Bangkok, for instance, is estimated to sink between 0.5 and 1cm per year (WWF 2009). As 44 per cent of Thailand's GDP is produced in Bangkok alone, a Katrina-like event would have major repercussions for Thailand's economy (cf. WWF 2009a). SLR is thereby unevenly distributed in the region, with Indonesia experiencing up to 0.8cm per year (ADB 2009).

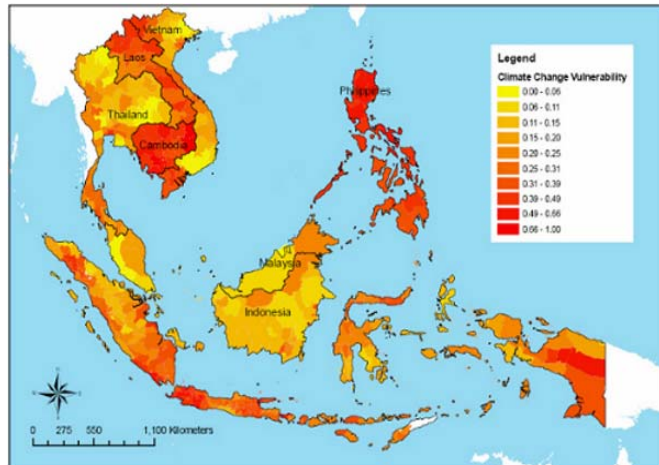
Aside from the direct threat of SLR, several **mega-cities are particularly vulnerable** to climate change impacts such as more severe and more frequent weather events. In particular, Manila, Phnom Penh, Jakarta and Ho Chi Minh City are vulnerable to potential increases in storm surges, flooding and drought (WWF 2009a).

In contrast to the Middle East (Brauch 2007; Brown/Crawford 2009) or Central Asia (Giese/Sehring 2007), SEA offers abundant renewable natural resources, particularly water. Also, regional warming is not above the global average and will more gradually manifest than in other regions. Key challenges are emerging from increasing **climate variability**, potential **changes in the monsoon cycle**, and **modes of governance and development**.

While the general trends of climate change are discernible for the upcoming decades at the global level, the concrete regional, national and sub-national consequences are not fully researched. Current models show great variability in whether precipitation will decrease or increase in the short- to long-term and to what extent (ADB 2009). In addition, the likelihood of extreme weather events, such as cyclones or droughts, will change. It will most likely become more frequent and/or more intense, but substantial knowledge is missing. Despite the limits of concrete modelling, regional changes of climate patterns are already visible today (WWF 2009). Hence, additional research will be necessary to delineate specific adaptation measures and policy responses.

In any case, **climate variability means unpredictability**. Furthermore, **weather patterns can change rapidly**, in fewer than ten years (see Vergara 2009). This could also affect the monsoon cycle in the region, which would have significant consequences. Ecosystems and agriculture have adapted to a relatively stable monsoon cycle (Lenton et al. 2009: 22). Yet, even small changes could have far-reaching consequences and could lead to ecosystem deterioration and loss of harvests. Given the increased variability, repeated shocks are not impossible. As a consequence, storm surges and other extreme weather events could affect wider regions and create devastating impacts.

With increasing climate variability, the need for vulnerability reduction becomes more pronounced. Vulnerability varies strongly across the region, depending on geographical context factors as well as access to technology, capital and other factors (see map 8). Policies focusing on vulnerability reduction and adaptation, however, are currently very technically focused (Resurreccion et al. 2009), omitting the social complexities on the ground. Furthermore, adaptation policies are hardly



Map 2: Climate Change Vulnerability in South East Asia.
Source: Yusuf/Francisco 2009

coordinated on a national or regional level, increasing the risk of contradicting policies. This could lead to use-competition for different purposes, such as water use for tourism and adaptation.³ Most activities are therefore organised heavily by a top-down approach, with little knowledge of local issues, problems or sensitivity for local livelihoods (cf. Resurreccion et al. 2009).⁴

Several countries also embarked on further **damming of the Mekong River** to improve electricity production. While they can act as water storages, these activities are most likely to damage ecosystems and reduce water flows, leading to negative side effects in other areas (WWF 2009). Outside of SEA, China is increasingly drawing water from the Mekong River, which will reduce access to water in continental SEA even further. Hence, while SEA is less challenged by climate change with regard to water and other resources as elsewhere in the world, converging developments and current policies could nevertheless have very negative effects. At the same time, as unpredictability and variability of climate and weather patterns increase, the risk of a crises (food, water, electricity, disasters, etc.) will most likely increase

³ Interview with researcher, Bangkok University, 4 September 2009.

⁴ Interview with civil society representative, Bangkok, 2 September 2009.

Climate hazards hotspots	Dominant hazards
Northwestern Vietnam	Droughts
Eastern coastal areas of Vietnam	Cyclones, droughts
Mekong region of Vietnam	Sea-level rise
Bangkok and its surrounding area in Thailand	Sea-level rise, floods
Southern regions of Thailand	Droughts, floods
The Philippines	Cyclones, landslides, floods, droughts
Sabah State in Malaysia	Droughts
Western and eastern area of Java Island, Indonesia	Droughts, floods, landslides, sea-level rise

Table 2: Climate hazard hotspots and dominant hazards. Source: Yusuf/Francisco 2009

4. Risk Analysis and Scenarios

In South East Asia, a major challenge arises from the **risk of converging crises** due to the fact that food, water and energy security are interconnected. As demand for all three will increase in the upcoming decades, shocks such as natural disasters or droughts could have **devastating knock-on effects**. Increasing climate variability will make it more difficult to predict timing, size and impact of such events. If multiple crises occur in short succession, this could cascade into other areas as well, **interfacing with political instability** and armed conflicts in the region. Aside from this, the **Mekong River will become increasingly taxed** by the six riparian countries. Even without climate change, the conflicting priorities of the riparian nations could have **negative repercussions** for human development in the region. Climate change is likely to accentuate them further.

Climate change is likely to become a challenge for human development in South East Asia. Access to food, water and energy could slow down the eradication of poverty and human development. The loss of income and degradation of productive landscape at home could further exacerbate the substantive migration taking place in the region, thereby increasing competition for jobs between marginalised groups. At the same time, the loss of economic opportunities in destination countries could result in more hostile reactions towards incoming migrants.

Many potential lines of friction persist in South East Asia. Political stability in the region will strongly depend on choices and developments in the upcoming decade. This includes resolving the political crisis in Thailand's polarised society or the various remaining armed conflicts. The question of maritime borders already exists, although it may become more dynamic (and potentially more exacerbated) in the future. Domestic violent conflicts between armed groups and central governments

revolve around secessions or toppling regimes perceived as unfair and inequitable. If climate change impacts are not managed properly, central governments may further lose legitimacy.

Below are two developments that could possibly occur: Illustrative scenarios⁵ on the interaction of climate change with the current social, economic and political trajectories of the region outlined how climate change may affect stability and security in South East Asia. Based on the findings above, each begins with a set of "key drivers": factors which are either present today already or which will likely be further aggravated in the future by climate change. Stability and security are broadly defined to accommodate the different impact dimensions of climate change.

⁵ Many studies on climate change and security use a scenario-approach due to the novelty of the issue and its complexity (see Maas/Tänzler 2009). For a further elaboration of this approach, please see WBGU 2007.

4.1. Conflicting Priorities in the Mekong Subregion

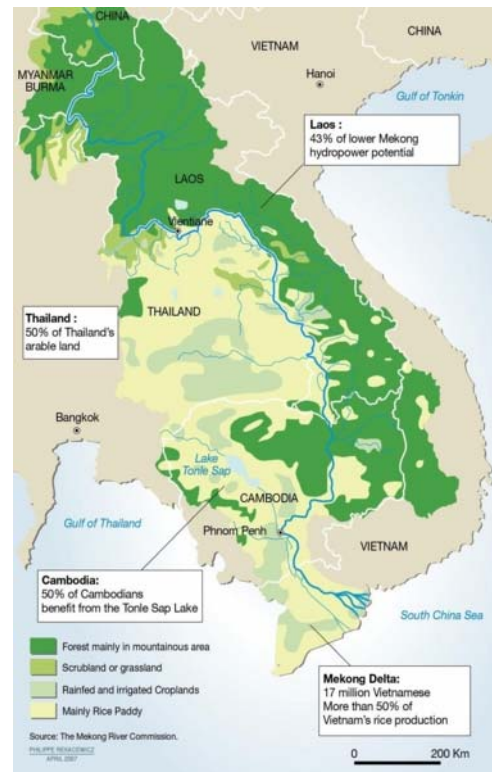
Key Drivers:

- Economic development in South East Asia and adjacent Chinese provinces continues rapidly.
- Energy and resource demands escalate accordingly.
- Climate change will exacerbate seasons, but the flows of the Mekong River are likely to become less predictable.
- The countries in the region pursue national development plans without sufficient coordination at the regional level.

Six countries share the 5,800 kilometre long Mekong River. Approximately 65 million people are living in the Mekong region (WWF 2009: 15). The river and its tributaries are vital for the production of food, particular in the fertile Mekong delta, electricity production, shipping and transport, and regional ecosystems. All these pressures on the Mekong will increase in the next few decades due to population and economic growth.

Climate change will exacerbate dry and wet seasons. Increased glacial melt from the Himalayas will augment the risk of flooding. Additionally, regional warming will exacerbate dry seasons due to higher evaporation. In addition, climate variability is likely to increase, making the Mekong water flows less predictable. The damming of the river will negatively affect the river ecosystems in addition to climate change impacts.

The combination of both will become particularly challenging for downstream countries such as Vietnam. In addition, Cambodia and Laos are among the most vulnerable to climate change impacts (Yusuf/Francisco 2009). Vietnam will be severely impacted by SLR and related trends, because half of Vietnam's rice production is concentrated in the Mekong delta (WWF 2009). Decreasing water flows from the Mekong increase saltwater intrusion, curtail agricultural productivity and provide less water for irrigation. As Vietnam is a major food exporter⁶, the



Map 3: The Flow of the Mekong River
Source: UNEP 2009a

impacts may lead to decreased global supply and consequently raise the level of food insecurity in importing countries. However, not damming the river while economic development continues, results in energy shortages.

Currently, no effective and comprehensive water sharing agreement exists. Many regional environmental agreements are non-binding and require national legislation to become effective.⁷ Downstream countries have voiced their concern of how upstream countries are developing the region (Vo 2008). Uncoordinated coping strategies by individual countries – either for adapting to climate changes or to satisfy increasing demands for food, water and electricity – are likely to have negative consequences for neighbouring countries.

While the taxing of the Mekong River may lead to disputes over water sharing between states, the critical impacts will be at the sub-national level. Currently, as consequences of damming projects and development of the Mekong River continue, migration movements are already visible (cf. WWF 2009). A

⁶ Vietnam alone exported seven million tons of rice in 2008 (Reuters, quoted in WWF 2009).

⁷ Interview with researcher at Bangkok University, 2 September 2009.

deterioration of the Mekong River system will reduce crop yields and employment opportunities, setting more regional migration in motion and potentially resulting in local level conflicts. Competition for jobs and social tensions in larger urban areas increase as a result of the inflow.⁸

Climate change will exacerbate these stresses further due to increased variability. The melting of the Himalayan glaciers will increase water flows in the next decades. However, after the glaciers have melted, water levels may decrease dramatically. Also, climate change supports the emergence of an interconnected crisis: As the region's trajectories in regard to energy, economic development and food production are tied to the Mekong River, a severe drought would lead to food insecurity, water scarcity, economic loss and electricity shortages.

A likely policy that prioritises national interests in such a situation would have dramatic consequences for downstream countries. In particular, Vietnam could face significant water shortages and extensive salt water intrusion due to lowered flows of the Mekong. Aside from use-competition between sectors (agriculture, energy, etc.) within countries and between countries, this would have wider regional and global repercussions. If Vietnam and other countries' food exports dramatically sink, this triggers export bans and curtail global food supplies.

4.2. Converging Crises

Key Drivers:

- The underlying trends which triggered the food and energy crisis in 2008 would persist and become more exacerbated.
- Climate variability will increase in the region and around the globe, thus amplifying the risk of sudden shocks. The risk for multiple simultaneous crises – food, energy, disasters – will also increase accordingly.
- States in South East Asia (and around the world) revert to national instead of regional solutions to deal with food security and disasters.
- Crisis events proliferate and cascade, interfacing with political turmoil and existing armed conflicts.

The 2008 food crisis was the result of multiple converging factors, which had accumulated over several years. This includes increasing demands due to rising populations, rising energy prices (increasing the costs of harvesting, processing and transporting of food), increased use of crops for biofuels instead of food, several lost harvests due to drought and other weather events, financial speculation, and depleted storages. The spike in food prices particularly affected the poor, eradicated gains in development and caused millions to starve. Several states banned exports, which led to even higher international prices. While none of these trends on its own could have resulted in the crisis, the combination of factors amplified each other (Evans 2008; Williams/Anthony 2008). As a consequence, several countries or state-owned companies have started to acquire land to improve national food security in case such an event reoccurs. This included in some cases negotiations with land-selling countries to deploy security forces that could defend these investments (Kumetat 2009). In Madagascar's case, large acquisitions of land by a South Korean company sparked further controversy in an already politically unstable country (see Evans 2008a).

Globally, climate change is likely to decrease food production. Rising populations will increase demand for food, but also water and energy. The demand for food will also provide incentives for financial speculation to artificially inflate prices (cf. Kumetat 2009). Thus, the factors which contributed to the food crisis in 2008 will persist and become more aggravated (see Evans 2008). Potential shocks induced by climate variability such as droughts or extreme weather events will lead to a sudden drop in supply and subsequent price escalations. As the current mode of response by governments is to assure national food security, a price hike will trigger export bans, which would further accelerate the crisis.

A new food crisis may converge with other crises. Energy crises could escalate in times of drought, as electricity production in South East Asia is strongly dependent on hydropower (see also above). While

⁸ Interview with IOM representative, IOM Regional Office, 2 September 2009.

each of these crises is a challenge in its own, they could amplify each other.

The interconnected crises could stall and ultimately reverse development. This would reduce the capacities of states to react to future crises. Reconstruction in the aftermath of disasters or the need to subsidise food could curtail financial capacities, while state capacities to respond to disasters would be overstretched. Making national security a priority could also weaken support for neighbouring countries in times of crisis and disaster.

In case multiple, successive crises (food, energy, disasters) unfold, it will cascade and make states vulnerable to political instability. This will occur if the following takes place: when governments are perceived as incompetent to deal with the ongoing crisis; when groups feel marginalised or treated unfairly. This interfaces with current armed conflicts.

Ultimately, the combination may reach a tipping point, where a state destabilises.

4.3. Conclusions

The two hot spots above reveal that the major challenge of South East Asia is coordinating policies. While the developments in the different policy areas on its own may be insufficient to instigate a crisis due to climate change, the combination of them increases the risk. Furthermore, many areas are climate-dependent – such as in the Mekong region – where severe climate-related events could trigger a crisis. Response policies such as export bans and prioritising national interests may accelerate such events further and worsen the situations of countries. A particular challenge thereby is that such events may unfold quite rapidly, leaving little time for coordination and joint action.

5. Recommendations

Climate change will negatively impact South East Asia, particularly through **increased climate variability and unpredictable weather patterns**. As ecosystems, populations and economies are **accustomed to relative stable patterns**, this could have significant repercussions. As a result, the risk of **interconnected crises emerges**, which could mutually amplify each other. **Early adaptation, advanced planning and mainstreaming disaster risk reduction** are among the key priorities. Further analysis and research will be necessary, but **no-regret measures** can start immediately and will have additional co-benefits. Finally, **enhanced international cooperation** and coordination will be necessary to harness synergy effects and avoid contradicting policies.

Coping with the challenges of climate change is not beyond the reach of South East Asia. The region features advanced economies and vibrant, dynamic societies. While climate change is likely to occur through gradual impacts as well as increased variability and unpredictability in the region, the convergence of regional trends increase the risk of crisis, which could quickly spread to other areas. Reflecting on these convergences and understanding how they could mutually interact will be vital. Improved cooperation and coordination within and across countries will be necessary to reduce potentials for frictions, limit feedback effects and increase societal resilience.

A **pathway to prevent** climate change inducing or exacerbating crises would require early action on improving knowledge of climate change and its impacts, analysing potential threats, identifying

connections between threats and developing cross-cutting response plans. Countries would need to exchange information on a very significant level, pool resources and develop joint risk mitigation strategies. In case crises or disaster struck, cooperation is necessary to quickly contain such events and prevent it from creating a domino effect.

Security implications of climate change are largely framed in terms of livelihoods and human security in South East Asia. Questions of food security, access to water, eradication of poverty and reducing vulnerability of disasters are emerging priorities in the region. The consultation between the EU and the ASEAN Regional Forum (ARF) in March 2009 showed that several states in the region are acutely aware of the emerging challenges of climate change (cf. ARF 2009). This particularly includes Vietnam, but also major donors such as Japan. It was agreed

upon to continue the dialogue and hold another meeting in 2010 in Europe. Thus, a political dialogue on potential security implications of climate change was initiated.

Within the region, several organisations – particularly research centres – started to question the potential security implications of climate change. Among others, the Council for Security Cooperation in the Asia Pacific (CSCAP) is working on a study and set of recommendations intended to address governments in the Asia-Pacific (ARF 2009). A major part of CSCAP's work will focus on uncertainties and potential cascading effects resulting from climate change. For these and other regions, progressive stakeholders in the region such as the regional UN Office for the Coordination of Humanitarian Affairs (OCHA) are taking a multi-hazard approach. While conflict and instability is one risk within the regions, the combination of these with extreme weather events, food and water insecurity, as well as other potential crises are key problems. Currently, mapping activities aim to identify particular hot spots where multiple hazards converge or may converge within the next few decades to form complex emergencies.⁹ Civil society organisations such as the World Wide Fund for Nature (WWF) and research organisations such as the Southeast Asia Global Change System for Analysis, Research and Training (START), continue to assess the impacts of climate change. The WWF also called for developing a comprehensive regional adaptation agreement on the Mekong region so to address the emerging challenges of climate change against the background of current development trajectories (WWF 2009).

Controversies exist, however, on whether climate change impacts should be approached from the angle of 'traditional security' and on whether climate change could impact political stability or potentially even violent conflict in the region. Debating the climate change's implications for international peace and security was met with reservation at the UN Security Council (UNSC) debate in April 2007. Only Indonesia voiced its perspective on the issue in summer 2009 when they were invited by the UN

Secretary General (UNSG) to do so.¹⁰ However, countries from SEA and the ARF have repeatedly stressed the role of industrialised countries in creating the climate change "problematique" and continuing to produce massively higher greenhouse gas emissions than the average citizen from South East Asia. CSCAP as well as other academic and civil society organisations have reservations against focusing too much on climate change because it would result in further top-down policies.¹¹ Community level activities, empowerment of local people and re-focusing governmental policies on sustainable development are more important and more relevant than solely focusing on climate change. As climate change will impact first and foremost the local community level, this in fact limits regions' adaptive capacities. As mentioned above (see chapter 3), adaptation policies of governments in the region are slow to emerge, limited in size and usually very technical, making them insufficient to cope with the complexities of climate change.

The upcoming budgetary cycle and the institutional reform under the treaty of Lisbon opens a **window of opportunity** for the EU to mainstream the security implications of climate change into its foreign and development policy. The **regional strategies** of the EU and **country strategy papers** covering the region will be key instruments for mainstreaming climate change. The EU could play an important role as facilitator in appreciating the comprehensive challenge climate change poses to the region. In particular, the following activities should be pursued:

Research, Analysis and Methodologies:

- **More analysis and research** is needed on a regional, national and sub-national scale to assess the impacts of climate change. This will also be necessary to develop early warning mechanisms and possible actions.
- **The interconnectedness of crises** and how they may mutually affect each other needs to be researched as well. Adaptation plans and policies have to be reflected again.

⁹ Interview with OCHA representative, OCHA regional office Bangkok, 4 September 2009.

¹⁰ See http://www.un.org/esa/dsd/resources/res_docugaecos_64.shtml

¹¹ Interview with civil society representative, Bangkok, 2 September 2009.

- **Methodologies to advance risk management** must be improved. They need to be flexible enough to respond to sudden or multiple potential crises.

Institutional Development and Response Formulation

- **No-regret measures** such as mainstreaming disaster risk reduction, improving water and energy efficiency should be implemented. Besides mitigating climate-related impacts, they should have co-benefits such as reducing energy demands. In addition, they do not require concrete data to be implemented.
- **Cross-cutting national dialogues** between relevant sectors are necessary to bridge communication gaps, coordinate adaptation measures and avoid potentially contradicting policies.
- **Capacity development for analysis and research** is vital to improve regional capacities for early warning and analysis. This requires long-term engagement in higher education and training.

- **Local communities need to be empowered.** They will be the first impacted by climate change and climate variability. Improving their capacities to respond in the areas of analysis, risk planning and adaptation is critical to mitigate climate impacts.

Regional and International cooperation:

- **Regional coordination and dialogue** with regard to adaptation measures and uses of the Mekong River need to be improved. This has to include all riparian countries and focus on balancing multiple priorities, particularly energy, food, and environmental protection.
- **Regional agreements** on water sharing, adaptation and improved cooperation in the area of crisis management are necessary. In particular, cooperation concerning the use of the Mekong River needs to be improved. In addition, regional agreements to share resources in times of crisis, f. ex. during food price hikes, are necessary to mitigate its destabilising effects.

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