NATURAL RESOURCE MANAGEMENT FOR SUSTAINABLE GROWTH

Edited by
Mely Caballero-Anthony
and Richard Barichello

RSiS Nanyang Technological University | S. RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES

ASEAN-Canada Research Partnership

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PREFACE

Economic growth and development in Southeast Asia, to date, have been a double-edged sword. On the one hand, efforts at ASEAN integration through building an ASEAN Economic Community have provided member countries with greater opportunities to boost their trade and industries. In addition to trends of urbanisation and industrialisation in Southeast Asian countries, the agricultural sector has become ever so significant, even as its share of the economy diminishes. With the exception of Singapore and Brunei, agricultural and aquacultural productions play a significant role in the economies of ASEAN countries. For instance, 60 per cent of global fish production is from Asia, out of which a quarter is accounted for by ASEAN countries. Indonesia and Malaysia are also the world's biggest exporters of palm oil. With the growing global demand for food and natural resources, Southeast Asia's agricultural sector can be a vital player in the global supply chain.

On the other hand, the challenge of balancing development goals with environmental protection becomes more acute. A focus on increasing production of ASEAN's natural resources can acutely reduce biodiversity — an essential element for sustaining ecosystems and the provision of ecological services — and the long-term potential for sustainable development. Statistics on the richness of ASEAN's natural resources speak for itself — ASEAN covers a total land area of 4.4 million km^2 (or, nearly 439 million hectares [ha]), close to half (or, 203 million ha) of which is forest cover.[1] The region is also home to three mega biodiversity countries — Indonesia, Malaysia and the Philippines — with 1,014 protected terrestrial sites (418,000 km^2) and 94 protected marine sites (23,260 km^2).[2] Maintaining such wealth of biodiversity is indeed crucial not only to sustain productive ecosystems but also enhance future research and development.

It is against this regional challenge of protecting ecosystems that this edited volume becomes a timely contribution. The issue of '*Natural resource management for sustainable growth*' provides the overall theme for the second phase of the ASEAN-Canada Research Partnership, and builds

on the Partnership's first phase, which discussed economic inequality amid growth. Chapters in this volume highlight how unsustainable natural resource management has been a significant factor in growing economic inequality in Southeast Asia. The book's chapters have four themes — extractive resources, forestry, water and fisheries — and engage with varying methodologies, thus bringing unique perspectives to the existing literature on natural resource management in Southeast Asia.

The theme of extractive resources is discussed in the first chapter by Pichamon Yeophantong, entitled 'Civil regulation and Chinese resource investment in Vietnam and Myanmar', the chapter discusses localised resistance that has emerged in response to major Chinese investment schemes in mainland Southeast Asia's extractive industries. Focusing on two controversial Chinese-backed resource projects in Myanmar and Vietnam, the chapter posits that incipient advocacy networks have contributed in each case to broader processes of civil regulation amid high levels of state control, whereby the Chinese government and its state-owned enterprises have been pressured into shouldering greater corporate responsibility for their actions. Despite these efforts that improve the accountability and transparency of state and corporate actors, civil regulation of foreign direct investment and corporate conduct must be supplemented by sound policies and regulatory enforcement at the state level.

The chapters relating to forestry provide valuable insights into the varying developments in the sector. Shelly Hsieh, in 'Carbon market development in Indonesia and Thailand: Prospects and challenges', discusses a key development in forestry management, namely carbon markets. Hsieh outlines the prospects and challenges in developing carbon markets in Indonesia and Thailand through the following United Nations Framework Convention on Climate Change (UNFCCC) mechanisms: Reducing Emissions from Deforestation and forest Degradation (REDD+), Joint Crediting Mechanism (JCM) and Emissions Trading Schemes (ETS). The chapter explores and proposes updated approaches to strengthening

post-Kyoto carbon market mechanisms following lessons learned from the Clean Development Mechanism (CDM) and ETS around the world.

Shofwan Al Banna Choiruzzad's chapter, '"Source of destruction" or target of a "Trade war"? Competing narratives on the palm oil industry in Indonesia', focuses on the palm oil industry in Indonesia, and sheds light on how conflicting narratives used by non-governmental organisations (NGOs) and the industry have influenced state policies. NGOs' 'source of destruction' narrative has influenced discussions on the Law on Prevention and Eradication of Forest Destruction and successfully pushed the government to enact the moratorium on forest conversion. Even so, the palm oil industry's 'trade war' narrative has also successfully halted important demands from NGOs, such as reviews on existing concession permits within the mechanism of the moratorium. Further, the 'trade war' narrative gave new impetus to the establishment of inter-ministerial coordination to organise counter campaigns against the anti-palm oil campaigns and led to the inclusion of palm oil as an agenda item in Indonesia's economic diplomacy.

The two chapters on water take on different methodologies for discussing ways of improving the use of water resources in mainland Southeast Asia. Liliana Camacho, in 'Valuing the invaluable: Challenges in using total economic value to estimate the value of natural resources in the Salween River basin', attempts to quantify the economic value of ecosystem goods and services that may be lost due to the construction of proposed hydropower dams along the Salween River. The study also highlights the need for new economic value models that can be applied in collaborative decision-making settings. Meanwhile, Nguyen Huy Hoang's chapter, 'Enhancing water use efficiency for the sustainable development of the Cambodia-Laos-Vietnam Development Triangle: Case study of the Central Highlands of Vietnam', examines the prospects of improving efficient use of water to support subregional sustainable development. Examining the case of the Cambodia-Laos-Vietnam Development Triangle, Nguyen notes how the shortage of water — as a result of drought, high water demand and use, and poor and inefficient irrigation systems — has adverse effects on agricultural productivity and

other socioeconomic activities. The chapter concludes with a series of structured, non-structured and technical measures for improving water efficiency in the subregion.

The final two chapters examine Southeast Asia's fisheries sector. In her chapter, 'Fisheries transitions in Southeast Asia', Melissa Marschke discusses how improving governance in Southeast Asia's fisheries sector requires an in-depth understanding of how rapid changes in the sector impact local people, coastal resources and fisher livelihoods. These impacts include: (i) poor working conditions at the farm level and offshore as a result of rising global demand for cheap, plentiful seafood; and, (ii) adverse effects on fisher livelihoods due to increased demand for coastal resources. Gilles Maillet's chapter, 'Sustainable growth in Indonesian marine protected areas: Alternative livelihoods development as marine resource management strategy', complements Marschke's by assessing the effectiveness of alternative livelihoods strategies for coastal communities. Maillet examines how socioeconomic, environmental and cultural nuances determine the success of these strategies in marine protected areas in Indonesia. The study enhances the understanding of contributing or hindering factors to alternative livelihoods implementation, and leads to better informed sustainable growth policies for Indonesia's coastal regions that also offer lessons for other coastal member states of ASEAN.

With this range of perspectives by emerging and established scholars from ASEAN and Canada, the ASEAN-Canada Research Partnership not only seeks to add value to existing literature but also informs practitioners on ways forward for better natural resource management and sustained development in Southeast Asia.

As this edited volume is the final publication from the ASEAN-Canada Research Partnership, we would like to take this opportunity to thank the following groups for their efforts in making the ASEAN-Canada Research Partnership a success. First, the IDRC Regional Office in Southeast Asia for supporting the project. Second, members of the Advisory Committee — namely Jacques Bertrand, Paul Evans, Rosalia

Sciortino, Ton Nu Thi Ninh, Josef Yap and Supachai Yavaprabhas — who have not only advised on the direction of the research partnership but also provided invaluable guidance to our fellows, particularly the younger scholars. Finally, our thanks to Cheryl, Margareth and Sofiah from the Secretariat for their support in ensuring the seamless running of Research Partnership activities.

Mely Caballero-Anthony and
Richard Barichello
Project leaders for 2012–2015
ASEAN-Canada Research Partnership

[1] 'Forest and climate change dialogue in ASEAN' (PowerPoint presentation made by Agriculture Industries and Natural Resources Division, ASEAN Economic Community Department, ASEAN Secretariat), accessed 22 January 2016, https://www.cbd.int/forest/doc/wscb-fbdcc-01/Sept3/asean-en.pdf, 5.

[2] Ibid.

Chapter One

Civil Regulation and Chinese Resource Investment in Vietnam and Myanmar

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This chapter examines the localised resistance that has emerged in response to two controversial Chinese-backed schemes in Vietnam's and Myanmar's extractives sectors — bauxite mining in Vietnam's Central Highlands and the Sino-Myanmar oil and gas pipelines in Myanmar. It posits that incipient activist networks have contributed in each case to broader processes of civil regulation, whereby the Chinese government and its state-owned enterprises are pressured into shouldering greater corporate responsibility. Here, civil regulation is revealed to hold profound implications not only for corporate and investment practices within this industrialising region but also for sustainable resource governance. But, while civil regulation can help to improve the accountability of target actors, it must also be supplemented by sound policies and enforcement at the national level. The chapter thus argues that the onus of responsibility rests primarily with the Chinese and host governments to ensure that Chinese investors are abiding by local laws and China's own regulatory guidelines on responsible business conduct.

Keywords: Chinese investment, extractive industries, Myanmar, resistance, Vietnam

Biography

Pichamon Yeophantong is Lecturer in International Relations and Development in the School of Social Sciences, University of New South Wales, Sydney, Australia. She leads the Environmental Justice and Human Rights in Asia project at the Australian Human Rights Centre, and is also ASEAN-Canada Senior Fellow under the ASEAN-Canada Research Partnership and Research Associate at the Global Economic Governance Programme, University of Oxford, UK. Previously, Pichamon was a Global Leaders Fellow at University College, Oxford, and at the Niehaus Center for Globalization and Governance, Princeton University, US. She has held visiting fellowships at Peking University and National Taiwan University, among others. Her work has appeared in such publications as *Pacific Affairs, Chinese Journal of International Politics, Asian Survey and Yale Global*. She holds a PhD and MA in Politics and International Relations from the Australian National University, Canberra, Australia

1. Introduction

Resource investment in mainland Southeast Asia is generally known for being shrouded in secrecy. Negotiations tend to be arrived at behind closed doors, while project details are rarely disclosed to the public. Yet, not only can the by-products of large-scale, resource development projects prove detrimental to the environment — for instance, when chemicals used in mineral preparation and extraction processes contaminate local water supplies — but their social ramifications on local communities and livelihoods can be equally severe and long term. Crucially, these concerns echo those that have been raised against Chinese investment in the region's extractive industries.

As China seeks to secure its access to vital natural resources overseas[1], Chinese-backed resource schemes have become prominent targets of public censure and, in some cases, intense opposition. A tendency to invest in high-risk projects has given rise to popularised (albeit, at times, stereotyped) depictions of Chinese firms as profit-maximisers

unattuned to local needs and customs. Often accused of flouting social and environmental safeguards, the activities of Chinese investors in developing countries, from Cambodia and Ethiopia to Venezuela, have managed to not just adversely impact China's reputation[2] but also prompt questions over the disingenuity of Beijing's 'new' peripheral diplomacy.[3]

Despite the pervasive lack of transparency seen within the Mekong region[4], recent years have witnessed a notable rise in the regional public's awareness and apprehension of the manifold threats posed by unchecked resource extraction. In certain Mekong countries, this has come in the form of sustained network activism and localised resistance. Adopting a comparative perspective that draws on field research conducted in China and Southeast Asia, this chapter unpacks the sustained opposition that has surfaced in response to two major Chinese-backed resource schemes in Vietnam's and pre-2016 Myanmar's[5] extractives sectors: (i) bauxite mining in Vietnam's Central Highlands; and, (ii) Sino-Myanmar oil and gas pipelines in Myanmar's Rakhine State.

As discussed in more detail later, both of these cases illustrate how localised resistance, mobilised by incipient activist networks, can contribute to broader processes of civil regulation.[6] Here, the Chinese state-owned enterprises (SOEs) involved, together with the Chinese and Mekong governments, have been pressured into shouldering greater corporate responsibility for the adverse consequences of their actions. These are striking developments, not least due to the high levels of state restrictiveness seen in Vietnam and Myanmar, which render engagement in civic activism precarious, if not outright dangerous.[7] A decade ago, the thought of Chinese SOEs responding in such manner to host-society concerns would have been inconceivable.

Comprised of a diverse cast of non-state actors and their supporters — ranging from local civil society groups and non-governmental organisations (NGOs) to journalists and parliamentarians — activist networks play a critical role in enhancing public awareness of otherwise neglected issues. They can serve as important catalysts of social

change, empowering communities and pushing target actors into greater conformance to established standards and prevailing expectations. This is not to say, however, that they will always be successful in generating immediate policy change (e.g., cancellation or suspension of a project). Instead, network activism can achieve procedural success by raising the costs of actor non-compliance to norms and standards and, in so doing, bring about nuanced shifts in the attitudes and policies of target actors. This is usually accomplished through: (i) direct engagement with target actors (i.e., a resource company); (ii) application of indirect pressure through the mobilisation of public and/or government involvement; or, (iii) some combination of both.

Sustained activism can, moreover, help to inaugurate new opportunity structures within the broader socio-political environment for future generations of activists. Especially in countries where civic activism is not widely practised or encouraged by the state, localised resistance in one area can set precedents and become a model for activists working in other areas to emulate. This, in effect, allows activists to build upon another campaign's momentum. Civil regulation thus holds important implications for improving corporate conduct in weak regulatory settings, as well as enhancing sustainable natural resource management.

This chapter proceeds in five sections. The first provides an overview of Chinese resource investments in mainland Southeast Asia. The second and third sections elaborate on how localised resistance surfaced in the Vietnamese and Myanmar cases, and how this, in turn, gave rise to processes of civil regulation. Here, I posit that the effect of resistance has been such that network activists have managed to engender policy change by appealing to the Chinese SOE as well as by pressuring the host government to reconsider the project in question. The fourth section then sets out the policy implications of civil regulation for the Chinese, Myanmar and Vietnamese governments, as well as for Chinese resource companies operating overseas. The final section concludes with some insights on effective strategies and the future of localised resistance within the Mekong region.

2. Chinese Resource Investment in Mainland Southeast Asia

China is among the largest investors in Myanmar and Vietnam. In 2013, Chinese foreign direct investment (FDI) in Myanmar was estimated at USD 14.1 billion, while the total capital of Chinese investment projects in Vietnam amounted to almost USD 5 billion[8]. In an effort to secure the country's gas imports, which are vital to meeting rising domestic energy needs, state-owned China National Petroleum Corporation (CNPC) has invested in what is deemed to be one of Myanmar's largest resource development schemes, involving the extraction of underwater natural gas off the country's western coast to be transported mainly to China through oil and gas pipelines. A subsidiary of the state-owned Aluminum Corporation of China (Chinalco) has likewise received licences from the Vietnamese government for large-scale mining exploration and development.

By virtue of being state-owned, Chinese resource SOEs maintain close ties to the central government, with their investment strategies largely aligning with the central government's policy directives.[9] Ever since the liberalisation of China's outbound investment regime in the late 1980s and early 1990s[10], Chinese SOEs have been actively encouraged to internationalise and facilitate the deepening of China's bilateral economic relations with its industrialising neighbours. This is reflected in Beijing's longstanding 'Go out' as well as 'South-South cooperation' strategies, and in more recent developments, such as the announcement of the 'One belt, one road' initiative and the promulgation of the revised measures for foreign investment management in September 2014, which relaxed the procedures involved in approving foreign investment projects.[11]

Well attuned to the development aspirations of its Southeast Asian neighbours, the Chinese government has assumed an important role in ensuring that its SOEs are seizing the window of opportunity left open by other foreign investors, whose best practice standards are often deemed too onerous by some of the Mekong governments.[12] Indeed, the common

Chinese practice of bundling investment deals with offers of development aid and concessional loans to countries, such as Cambodia and Laos, is instructive in this regard.

The close SOE-government relationship has, however, rendered Chinese national companies more susceptible to investing in socially and politically risky projects. Chinese investment has frequently flowed into countries that have good bilateral relations with China, but which tend to suffer from endemic corruption, accountability deficits and governance gaps. Here, considerations of political risk become sidelined in the interest calculations of these SOEs, which, as discussed later, can be to their own detriment. Illustrative of how political motives can take precedence over business interests is the example of the proposed Cheay Areng dam in Cambodia. Even though proving commercially unviable due to its low power-generation capacity, the highly contested project still proceeded with Chinese financing in a purported bid to further Chinese political interests within the country.[13]

That said, Chinese investors are not the only ones party to questionable business dealings within the region. Despite having FDI and environmental protection legislation in place, both the Myanmar and Vietnamese governments have so far demonstrated limited political will and institutional capacity to enforce these legal frameworks. Preference continues to be given to the large-scale extraction and export of finite natural resources as a means of fostering rapid economic growth and modernisation. Further, the fact that both of the disputed resource schemes examined in this chapter were being developed as joint ventures would seem to add credence to claims of collusion between the Chinese and Mekong governments involved.

It warrants note, nonetheless, that Chinese companies are not alone in committing themselves to questionable schemes. Concerns have likewise been raised over the conduct of major Thai banks and firms in Laos and Myanmar (e.g., the Xayaburi dam and Dawei Special

Economic Zone schemes), while Singaporean involvement in the highly controversial Boeung Kak Lake development project in Cambodia was widely criticised[14]. More than a decade earlier, the construction of the Yadana gas pipeline project in Myanmar by Total, Chevron and the now-defunct Unocal Corporation had spawned a protracted, transnational civil society campaign against it.[15] Indeed, the broader scheme to 'pipeline' Myanmar's oil and gas reserves also features investment from South Korea and India.

Even so, Chinese-backed resource projects are among those that have attracted the most controversy. Given their large-scale and wide-ranging repercussions, serious questions have been raised regarding the extent to which Chinese overseas investment is contributing to the economic and social well-being of developing host countries. Although FDI often comes with the promise of increased capital inflows that can help to generate employment and alleviate poverty, policy dissonance[16] and regulatory oversight could mean that such perceived blessings are quickly transformed into an all-too-real curse.

3. Bauxite Mining in Vietnam's Central Highlands

While it is possible to view the anti-bauxite protests in Vietnam as corollary to broader anti-Chinese sentiments that have grown in recent years as a result of territorial disputes in the South China Sea[17], this only tells part of the story. Bauxite mining in the ecologically diverse Central Highlands first became embroiled in nationwide controversy during the latter half of 2008. It was during this time that a wide cross-section of Vietnamese society spoke out against the government's plans to develop crude bauxite ore reserves, which are estimated in total at approximately 5.5 billion tonnes.[18] The environmental ramifications of bauxite mining are known to be severe, with some of the mines operating in Vietnam already producing the so-called toxic red sludge that can critically endanger the health of surrounding communities and the local ecology. Together with Aluminum Corporation of China Limited's (Chalco) involvement in the construction of two processing plants in the area, the issue quickly became framed as a 'national problem' within the public sphere.

The role played by Vietnamese activist networks in transforming this issue into a problem demanding collective action cannot be understated. If not for the advocacy efforts of one local Vietnamese NGO in particular, activism against the Vietnamese government and Chalco's plans to mine bauxite would likely not have emerged otherwise. Established in mid-2007, the Consultancy on Development (CODE) was the first organisation to investigate concerns reported by the national press about the deleterious impacts of bauxite mining in the Highlands.[19] Their first field trip to the area was conducted in July 2007, with findings subsequently published in a series of articles in the *Saigon Economic Times*.[20] Their activities soon caught the attention of local authorities, who up until then had only spoken about the benefits of bauxite mines. Notably, this culminated in an officially sanctioned seminar on bauxite mining and its impacts, jointly organised by CODE and the Dak Nong Provincial People's Committee.

Aware of their precarious existence within a highly restrictive political space, Vietnamese civil society does not necessarily eschew working with government agencies or bureaucrats to realise their objectives. On occasion, they may even seek to explicitly align their claims and demands with state-sanctioned ideologies as a means to reach out to potential sympathisers within the government, while concomitantly contesting the validity of state discourses.[21] To this end, the language of 'national interest' and 'development' can be used and manipulated by these groups such that it becomes difficult for official authorities to completely dismiss their 'legitimised' grievances. This approach was one employed by Vietnamese civil society in the bauxite mining case, and is what accounts for the distinctive attributes of the resulting activist network — characteristics that contrast with conventional (Western) depictions of civil society as autonomous organisations, which have little or no formal ties to the state.

Following CODE's Dak Nong workshop, another development would come to mark a critical juncture in the anti-bauxite campaign — the late national war-hero, General Võ Nguyên Giáp, sent an open letter to Prime Minister Nguyễn Tấn Dũng in January 2009 to personally protest

bauxite mining in the Highlands. By this time, the bauxite mining issue was no longer only about resources; it also impinged on broader security concerns, as the prospect of 'Chinese encroachment' in a strategically and historically important area galvanised people's fears of an impending 'Chinese threat' or even 'invasion'.[22] Soon enough, these concerns also drew the attention of other political figures, such as National Assembly delegate, Nguyen Lan Dung, and leader of the outlawed Unified Buddhist Church of Vietnam, Thích Quảng Độ, both of whom participated in the heated public debates that followed the release of Giáp's letter. Several Vietnamese-language websites and blogs, such as Bauxite Vietnam, further added a transnational dimension to the debate, with their websites attracting considerable attention from overseas Vietnamese environmental and political groups, including the US-based Viet Ecology Foundation and the outlawed political organisation, Viet Tan. The sentiments that ran high during this period subsequently became manifest in a major online petition to stop bauxite mining — of the 2,746 signatures received, at least 135 belonged to well-known Vietnamese intellectuals, who had signed the document in the face of sizeable risks.

In this way, the growing intensity of the mining debate served to expand the anti-bauxite activist network within Vietnam. With a cast of outspoken and authoritative figures lending their reputation to the 'stop bauxite mining' cause, this not only raised the campaign's public profile but also prompted an outburst of public censure of the scheme and, specifically, of Chinese involvement at a level not commonly seen in Vietnamese society. In fact, one could argue that the focus on China's involvement in the issue fulfilled a dual purpose — it allowed opponents of the scheme to frame their concerns in ways that the Vietnamese government found difficult to dismiss outright (i.e., by linking the issue to national security and prominent episodes in the country's historical memory), while the nationalist sentiments that consequently became attached to the resistance campaign served to ensure heightened public interest and attention.

Although the final outcome of Vietnam's anti-bauxite activism might appear somewhat limited — despite President Trương Tấn Sang's

announcement in late 2011 that Chinese investors would not be allowed to exploit bauxite reserves in the Central Highlands , Chalco was granted engineering, procurement and construction packages worth some USD 10 million — pressure generated from the nationwide resistance campaign did lead to two noteworthy outcomes. First was a government-sponsored 'scientific' conference in 2009, moderated by the Vietnam Union of Science and Technology Associations (VUSTA), which effectively signalled official acknowledgement of the concerns raised. Second, indicative of the regulatory impact of localised resistance, was the Politburo's affirmation of its commitment to limiting the scope of mining projects and undertaking proper environmental impact assessment studies. Even though anti-bauxite activists were not able to directly influence the policies of the Chinese government or SOE involved, they were able to bring about policy change indirectly by pressuring the Vietnamese government.

This is not, however, to suggest that the campaign met with no government backlash. State repression came in the form of, for example, arrests of prominent bloggers over the course of two months in 2009, as well as repeated attempts to shut down the Bauxite Vietnam website.[24] Despite this, resistance against bauxite mining in the Central Highlands persisted, with the Bauxite Vietnam website still in operation. Local civil society organisations, such as CODE and PanNature, have also continued to cooperate with government agencies to stimulate policy dialogue on this matter. In particular, they have pushed for the implementation of the Extractive Industries Transparency Initiative's (EITI) standards in the country's extractives sector. In 2013, a Vietnamese mining coalition was established, being comprised of government agencies and grassroots organisations, including CODE, PanNature and Vietnam Forum of Environmental Journalists (VFEJ).[25]

4. Sino-Myanmar Oil and Gas Pipelines

Civil regulation and network activism dynamics are similarly found in the case of localised resistance against the Sino-Myanmar oil and gas pipelines — and, more specifically, the Shwe gas pipeline. A joint venture

between CNPC and Myanmar's national petroleum company, Myanmar Oil & Gas Enterprise (MOGE), the Shwe gas pipeline underwent three years of construction and began operations in late 2013. Running from Kyaukphyu on Myanmar's west coast, the pipeline is to deliver an estimated 12 billion m^3 of gas annually for domestic consumption as well as to China's southwest provinces, including Yunnan and Guangxi.[26] The project is part of the Chinese government's broader resource strategy, which seeks to secure the country's access to vital energy resources. Prior to the pipeline's construction, China had to rely primarily on gas imported from the strategically volatile areas around the Malacca Strait.[27]

In spite of government attempts to publicise the scheme as a boon to Myanmar's economic development, this has not allayed the intense opposition that has emerged over the years in Myanmar against the project. Details of the scheme were not properly disclosed to affected communities, with no prior public consultation having been conducted by the Myanmar government or the companies involved. When it first became known that the natural gas extracted was destined for the Chinese market, this precipitated an unprecedented '24-hour electricity' campaign across Rakhine State in 2011, which saw youth groups and locals staging protests in towns, such as Kyauk Pru and Taungup, under the united banner of 'Our gas, our future'.[28]

Given how the project cuts across an ethnically fragile area, this has engendered an additional slate of concerns pertaining to the project's potentially wide-ranging social and environmental repercussions. There were tangible fears of chemical contamination in the event of leakages during the drilling process, which could threaten the ecology of the surrounding coastal areas. Moreover, despite CNPC's claims of handling land acquisition issues on the basis of 'voluntary decision' and fair compensation, accusations soon surfaced over forced labour practices and land confiscation during the project's construction phase. This reportedly led to the displacement of communities, largely on the Maday and Ramree islands. Research undertaken by Arakan Oil Watch (AOW), a member organisation of OilWatch Southeast Asia, added credence to these claims, with concerns further raised over revenue transparency

— the sale of Shwe gas to China is estimated to bring in over USD 29 billion for the Myanmar government over the next 30 years.[29]

Public opposition to the pipelines project would peak in 2013, when a series of local demonstrations were organised against it. One of the earliest instances of mass protest within Myanmar against the scheme took place in April 2013 on Maday Island. Attended by approximately 400 people — the majority of whom were subsistence fishermen[30] — protesters marched to CNPC's office to demand the project's immediate suspension as well as adequate compensation for confiscated lands. It was also during this period that the Myanmar-China Pipeline Watch Committee (MCPWC), an alliance of 12 civil society groups, was formed in Mandalay. Since its inception, MCPWC has successfully spearheaded a signature campaign, having also conducted a social impact assessment survey of the pipelines' impact on local communities in three affected townships in Rakhine State.[31]

Aside from the formation of domestic activist networks, resistance against the oil and gas pipelines has notably showcased transnational linkages as well. With transnational NGOs, such as the Chiang Mai-based Burma Environmental Working Group (BEWG), EarthRights International (ERI) and International Federation for Human Rights (FIDH), working alongside Burmese civil society groups, including Paung Ku, Myanmar Green Network (MGN) and Thazin Development Foundation, the issue was able to gain more national as well as regional attention. In 2012, seeking to place increased pressure on the Myanmar government and CNPC to account for the adverse ramifications of their joint venture, 130 NGOs from over 20 countries orchestrated a 'Global day of action' against the oil and gas pipelines. This involved the staging of public demonstrations in front of Chinese embassies and the submission of letters to President Thein Sein, requesting the project's postponement.[32] Crucially, in 2014, a local environmental and human rights group, Badeidha Moe Civil Society Organization, organised a much publicised photo exhibition in Yangon, which featured photos taken by villagers of the environmental degradation and uneven development caused by the project.

What the emergence of bottom-up opposition against the Chinese-led oil and gas pipelines underscores, in effect, is the importance of broad-based activist networks to popular mobilisation under restrictive state conditions. Anti-pipeline activists operating within Myanmar were able to 'bypass' the state, in large part, due to the assistance and support they received from an incipient network of like-minded individuals and organisations. According to one civil society activist, given the difficulty in accessing politically sensitive information in Myanmar, their group had to rely to a considerable degree on information gathered by individuals working with CNPC, as well as on data from international partner organisations, such as Revenue Watch Institute (now, Natural Resource Governance Institute [NRGI]) and ERI.[33] Such information was then disseminated within the organisation's wider network. Building on their contacts with popular media outlets, including *The Irrawaddy* and *Democratic Voice of Burma*, civil society groups have also managed to utilise the media to their advantage. Extensive coverage of the issue contributed to catapulting local concerns onto both the national and regional public spheres — a feat that would have otherwise been difficult to achieve considering the Myanmar government's track record of rule by impunity.

The transnational linkages and broad membership base of the anti-pipelines campaign help to account for both the longevity of the issue and the persistence of activism surrounding it. The Shwe Gas Movement (SGM), for one, was formed in late 2002 by the All Arakan Students' and Youths' Congress (AASYC), with offices in Thailand, India and Bangladesh.[34] Having been 'born as a resistance movement'[35], it is described as a coalition of activists and civil society organisations, whose international partners include, inter alia, AOW, Korean Federation for Environmental Movement (KFEM) and an Indian platform, The Other Media. As part of its broader aim of monitoring and curtailing natural gas extraction throughout Myanmar, SGM has been especially crucial to publicising and sharing information about the Sino-Myanmar pipelines, as well as coordinating resistance against them. As early as 2005, the coalition was aware of plans to explore, extract and export Myanmar's

oil and gas deposits through 'overland pipelines' to Yunnan Province.[36] Since then, SGM has capitalised upon the momentum and learnt from the strategies of a pre-existing, region-wide activist network — one which had evolved over the course of activism in the 1990s and 2000s (e.g., the aforementioned Yadana gas pipeline campaign and the ongoing anti-Salween dams movement)[37] — to inform its own campaign.[38]

Network activism on the pipelines issue has largely elicited mixed responses from CNPC and the Myanmar government. On the one hand, a number of civil society activists have met with state repression, with 10 activists having been sentenced to three-month jail terms for protesting without a permit.[39] Yet, on the other, through the activism of SGM and its involvement in such civil society coalitions as Myanmar Alliance for Transparency and Accountability (MATA), this helped to ensure formal civil society representation on the Shwe gas issue in processes such as the EITI Multi-Stakeholder Group (MSG) mechanism. Myanmar's EITI candidacy, which was subsequently approved in 2014[40], had also reportedly been pushed through as a result of extensive advocacy by 'inside and outside groups'.[41]

Following protests in April 2013, the Southeast Asia Gas Pipeline Company (SEAGP) and Southeast Asia Crude Oil Pipeline Company (SEAOP)[42] had arranged a media briefing to explain the developmental advantages of the Shwe gas project.[43] CNPC also launched a dedicated public relations campaign in response to the accusations levelled against it. These are noteworthy developments given how, up until recently, Chinese SOEs tend to pay little attention to community engagement and the need to address local concerns. Further, in an ongoing attempt to improve the company's reputation — a matter that gained heightened policy resonance in the aftermath of the Myitsone dam's suspension[44] — CNPC has initiated a series of corporate social responsibility projects within the affected areas. In an attempt to improve its relationship with communities, these projects are purportedly guided by the principle of 'mutually beneficial development' and the desire to reinforce China-Myanmar '*paukphaw*' (fraternal) ties. Earlier, in 2012, CNPC announced a

USD 1 million-aid scheme that would see the construction of 21 schools, two medical substations and two kindergartens in nearby villages. The company also committed to donate a further USD 10 million to support the development of a new power line project in Rakhine State.[45] In total, CNPC has invested an estimated total of USD 20 million for 'use in education, medical treatment, health and disaster relief'.[46]

Although the Myanmar section's oil and gas pipelines are now operational, the campaign against the pipelines continues.[47] A dispute that broke out between ethnic Chin and Chinese workers at one of the pipeline's work sites in early 2014 served to highlight not only the rising anti-Chinese sentiments within the country but also another layer of discontentment with the scheme.[48] This event was notably followed by a visit to China by a delegation of leaders from the Rakhine National Party (RNP) and National Democratic Force (NDF), with the stated purpose of alerting officials in Beijing to the problems posed by Chinese-backed resource schemes and urging them to 'control Chinese businesses in Myanmar'.[49] Interestingly, opposition to China's broader oil and gas projects has surfaced in China as well. In 2013, residents of Kunming mobilised against CNPC's construction of an oil refinery in Anning, which is expected to process the crude oil imported from Myanmar, and a paraxylene plant in Kunming.[50] Civil society groups within Myanmar had, at one point, expressed hope that such displays of public resistance within China would delay — or even derail — construction of the Sino-Myanmar pipelines.

5. Civil Regulation and Development in the Mekong Region

With the emergence of a nascent regional public sphere, the Chinese and Mekong governments are finding themselves increasingly confronted by demands for responsibility and answerability. At a time when the adverse ramifications of major resource schemes can provoke intense public ire, activists and affected communities are becoming bolder in their efforts to shed light on, and resist, questionable business and government dealings.

Without the opposition mobilised by network activists, the environmental and social problems associated with the Sino-Myanmar pipelines and bauxite mining in Vietnam's Central Highlands are unlikely to have become the prominent issues they are now. While work on the Sino-Myanmar pipelines has continued and plans to mine bauxite in the Central Highlands have not dissipated entirely, that networks of localised resistance were able to cast a critical light on these schemes, graft their concerns onto the national policy agenda and elicit noteworthy responses from the key stakeholders involved (i.e., respective governments and SOEs) remain important outcomes.

However, to guarantee government accountability and responsible business conduct, civil regulation alone is not sufficient. Processes of civil regulation tend to take place on an informal and ad hoc basis, and therefore must be supplemented by more institutionalised forms of regulation by the state. Here, responsibility for monitoring investment and corporate conduct lies with both the home- and host-country governments, as well as with the company itself. In addition to enforcing their existing FDI and environmental laws and regulations, the Myanmar and Vietnamese governments need to streamline participatory and transparent policymaking processes, where public consultation and disclosure are assured.

In the long run, regulatory enforcement will help to ensure that Chinese resource investment in mainland Southeast Asia serves as a genuine basis for 'mutually beneficial' relationships. More specifically, the institution of transparent and consultative policymaking processes, together with the enforcement of best practice standards in the resource sector, can help to steer Mekong governments away from signing exploitative contracts, where short-term economic gain from resource extraction is (at times, unwittingly) exchanged for irrevocable social and ecological harm. Arguably, there is potential here for the further development of a common FDI regulatory and policy framework within the region, one that builds upon existing initiatives (for e.g., China-ASEAN Investment Cooperation Fund [CAF][51] and United Nations

Global Compact) and processes (for e.g., Organisation for Economic Co-operation and Development's [OECD] investment policy reviews).

Furthermore, considering how the Myanmar and Vietnamese governments have both been seeking to attract more FDI inflows, strengthening transparency and the rule of law can improve investor confidence and facilitate investment promotion. This could be achieved through, for instance, the publication of whistle-blower protection laws, as well as the enforcement of public disclosure and competitive bidding requirements for resource development schemes. It can also help to prevent the influx of FDI from crippling the competitiveness of domestic firms. In the absence of sound policies and regulatory enforcement, the government risks jeopardising its political legitimacy as well as reversing the country's development. The oil and gas pipelines project in Myanmar, for one, has not only served as a fault line for protracted ethnic conflict but has also put into question the government's commitment to building a more democratic system of governance.

The Chinese government, likewise, needs to exercise tighter oversight over its national companies. As the Chinese leadership has recognised on different occasions, irresponsible business practices abroad can reflect badly on China's reputation as a whole.[52] With the international investment regime now transitioning toward a stronger focus on responsible investment, there is increased scrutiny on firms to conduct due diligence for political risk and rightfully earn their social licence to operate. Especially for emerging-market firms, reputational considerations prove all the more important, as building trust and brand awareness become integral to the firms' competitiveness. China Power Investment Corporation's (CPI) failure to take out a political risk insurance on the Myitsone dam project in Myanmar, coupled with its failure to undertake proper social and environmental impact assessments, is a case in point.[53] Indeed, a growing volume of scholarship is now revealing how investing in 'responsible investment' — that is, investment that takes into account environmental, social and governance issues — is conducive to enhancing a company's performance in the long term.[54]

6. Conclusion

This chapter examined how two cases of localised resistance in Myanmar and Vietnam against Chinese-backed resource projects have yielded notable outcomes, suggesting how network activists are beginning to act as external 'game changers' in regulating Chinese resource investment within the Mekong region. Here, activists and their network of supporters were responsible for transforming the bauxite mining and pipelines projects into prominent 'issues' of collective concern and, in so doing, prompting concerted action.[55]

This, in effect, raises the bigger question of what the implications of network activism are for development in the region. The displays of activism-cum-resistance in both the Vietnamese and Myanmar examples speak, in essence, to the importance of 'indigenous' processes of learning. The activist networks that surfaced in either case were largely the products of bottom-up efforts, with the bulk of external support having come once local opposition was already underway. Accordingly, it was the capacity for local initiative and innovation that proved critical to the mobilisation of these campaigns under 'unfavourable' conditions[56] and, more broadly, to the development of the regional public sphere.

Emerging trends further suggest that localised resistance could occur with greater frequency over time, as economic integration and blurring regional boundaries gradually bring communities closer together. Although government-to-government relations continue to inform the region's power dynamics, people-to-people ties have been growing alongside deepening transnational interactions. The ASEAN People's Forum (APF) constitutes one manifestation of this trend, reflecting a shared desire among the regional public to strengthen and broaden existing networks.

The future of localised resistance within the region will, nevertheless, hinge considerably upon the effectiveness of the strategies adopted by

activist networks. Three strategies that have been successfully used by resisters in the Myanmar and Vietnamese cases to bring about civil regulation can be identified here. First, drawing upon elements of 'rightful resistance' — that is, adopting discourses that accord with government rhetoric, but manipulating them in ways that render them supportive of one's own cause — and appealing directly to one's respective government (to place indirect pressure on a Chinese investor) promise to yield more 'immediate' results. This was evident in the Vietnamese case, where anti-bauxite activists used the language of national interest and security to attract attention, and even a degree of cooperation from certain agencies within the government, and where the Vietnamese government was primarily responsible for enforcing corporate compliance to extant regulations.

Second, establishing a broad support base through constructive engagement with government and/or international actors is critical to the impact and longevity of network activism and subsequent acts of resistance. As previously explained, international involvement helped to bolster public opposition against the Sino-Myanmar oil and gas pipelines, affording the campaign a wider audience, whereas sympathisers in the government and military supported the anti-bauxite coalition in Vietnam and heightened the campaign's policy resonance.

Finally, the degree of issue specificity can impinge on the effectiveness of network activism. It is important that activist networks, which tend to adopt ambitious mandates due to their amorphous membership and organisational identity, cultivate their reputation as 'experts' within focused issue areas. As seen from the network that emerged from the advocacy efforts of CODE, which had led the initial fact-finding work on bauxite mining in Vietnam, with expertise came credibility and trust from communities. Moreover, by working within a well-defined understanding of their shared cause, this meant that activists were able to identify precisely who their target actors were as well as communicate a cohesive campaign with clear objectives to the public.

Even so, while civil regulation can encourage more accountable and transparent investment practices, it must still be predicated upon sound policies and regulatory enforcement at the national level. What the instances of localised resistance discussed here underscore is the exigent need for inclusive policymaking that observes best practices, particularly those pertaining to public consultation and information disclosure. The onus of responsibility thus rests primarily with host governments to uphold local laws and standards, as well as with the Chinese government to ensure that its own guidelines on corporate social and environmental responsibility are adhered to by its national companies investing in the Mekong region and beyond.

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Chapter Two

Carbon Market Development in Indonesia and Thailand: Prospects and Challenges

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This paper assesses the opportunities and challenges in Indonesia and Thailand as they try to incentivise emissions reductions by putting a price on carbon. Particular attention is paid to the progress of recently introduced carbon market mechanisms that are also under consideration in the Framework for Various Approaches (FVA) under the United Nations Framework Convention on Climate Change (UNFCCC), especially Reducing Emissions from Deforestation and Forest Degradation (REDD+), Joint Crediting Mechanism (JCM) and Emissions Trading Scheme (ETS). The initiatives in each country are broken down to corresponding policies, design elements and targets to expose the status quo as well as assess the components of existing approaches that may offer the most promising prospects for continuous support.

The study reveals that carbon market development in Indonesia and Thailand is a space of opportunism, where progress hinges upon the ebbs and flows of the surrounding economic environment and, as such, is strongly motivated by financial incentives or technological transfers that may subsequently enable economic benefits. It is argued that placing emphasis on the financial and economic benefits of developing carbon markets may be a more effective way of encouraging Indonesia and Thailand to continue exploring domestic carbon crediting or trading schemes and how they may link up with those of other international jurisdictions, especially as economic growth continues to dominate policy agendas. Ultimately, setting up sound financial, technical and legal frameworks to support nascent carbon market initiatives — even if they are voluntary in nature — is a more important first step than mandating participation, particularly in the wake of pervasive uncertainties about the value and future of international carbon credits.

Keywords: Carbon market, carbon market instruments, emissions reductions, Indonesia, Thailand

Biography

Shelly Hsieh is a Postgraduate Research Fellow at the Asia Pacific Foundation of Canada, Vancouver, Canada, where she focuses on exploring opportunities for trans-Pacific collaboration in energy, clean technology and climate policy. Before returning to her hometown of Vancouver, Shelly spent several years living in Beijing, China, where she contributed to academic, non-governmental and international projects related to civil society and sustainable development in emerging economies. Shelly holds a Double Master's degree in International Relations and Sustainable Development from the Institut d'études politiques de Paris (Sciences Po) in France and Peking University in China, as well as a Bachelor's degree with honours in Sociology from the University of Toronto, Canada.

1. Introduction

This study examines how Indonesia and Thailand are exploring market mechanisms to encourage economically incentivised carbon emission reduction, with the view to extrapolate potential pathways to a regional ASEAN carbon market.[1,2] Indonesia and Thailand were chosen as case studies because, firstly, they are leading the region in developing domestic carbon markets — particularly in Emissions Trading Schemes (ETS)[3] — as well as actively engaging in international carbon reduction initiatives. Secondly, as the two biggest economies by gross domestic product in Southeast Asia, Indonesia and Thailand have high potential to influence the uptake of carbon market mechanisms across the region, if they can successfully demonstrate to neighbouring countries that carbon emissions may be curbed without compromising economic growth.

While many local and international organisations have assessed carbon market readiness in Indonesia and Thailand as part of project development

preparation, few studies have compared and contrasted the designs and implementations of various carbon market mechanisms to reveal their pros and cons in a systematic way. Existing studies on carbon market development have tended to focus on the prospects and challenges of particular market mechanisms, such as Clean Development Mechanism (CDM)[4,5], ETS[6] or on sector-specific programmes (such as Reducing Emissions from Deforestation and Forest Degradation [REDD+][7]). None of these studies have examined emerging ETS in Indonesia and Thailand, and, at the regional level too, few studies look at ETS in Southeast Asia.[8]

This study seeks to address this gap in the literature by detailing Indonesia and Thailand's progress vis-à-vis implementing the following carbon market mechanisms — CDM, REDD+, Joint Crediting Mechanism (JCM)[9] and ETS. Using primarily official documents, supplemented by interviews and third-party reports, this research proposes a rubric that breaks down the various carbon market mechanisms by their design elements as a framework for cross-examining any gaps and overlaps. By assessing elements that have been repeated or discontinued in the quest to optimise carbon market design, the study seeks to answer why certain formulations of carbon market mechanisms may be more suitable or attractive for emerging economies, such as Indonesia and Thailand, and what this may suggest about the type of carbon market design that would offer more promise for regional scalability.

2. Background

2.1 Proliferation of carbon market mechanisms

Expectations of what a carbon market is supposed to achieve is continuously evolving. The launch of CDM in 1997 had primarily intended to reduce compliance costs in developed countries and contribute to sustainable development goals in developing countries. Since then, the international carbon market has been looking progressively towards incentivising emissions reductions and financial transfers at a far greater scale, with increasing attention paid to stimulating development and

ownership of sectoral or countrywide policies by developing countries.[10] Today, more than 18 jurisdictions around the world are experimenting with carbon market initiatives built upon good practices learned from a combination of these different mechanisms.[11]

It has been argued that pricing carbon with market instruments is the most cost-effective and economically efficient way of inducing large-scale greenhouse gas (GHG) emissions reductions.[12] A number of studies support the theoretical benefits of setting up carbon markets as the most flexible approach by which emissions reductions can be incentivised at the policy, industrial and consumer levels in response to changes in the market.[13]

Compared to command-and-control regulations — such as carbon taxation — implementing carbon reduction policies based on market mechanisms can alleviate costly administrative inputs from policymakers while simultaneously allowing industries greater flexibility to innovate the manner in which they manage costs or technologies associated with emissions reductions.[14] It has been suggested that, in command-and-control regulatory environments, firms may lack the incentive to voluntarily disclose true cost functions[15] and ultimately achieve less potential cost effectiveness.

Carbon market mechanisms may fall under one or both categories — crediting or cap-and-trade. Crediting carbon emissions does not necessarily imply that trading in a secondary market will occur, whereas cap-and-trade does involve the trading of issued credits. Carbon markets typically employ both mechanisms in design, with increasing openness to accommodate different types of credits and credit exchanges through discussions in the United Nations Framework Convention on Climate Change (UNFCCC)'s Framework for Various Approaches (FVA).

2.2 Challenges for carbon market development after EU ETS and CDM

Despite the proliferation of carbon markets around the world, these markets continue to face tremendous challenges to defend their

effectiveness in either encouraging absolute carbon reductions or providing sufficient economic incentive to attract and retain the private sector participation it desperately needs.

The close of the first Kyoto commitment period (2008–2012) has seen a sharp decline in global enthusiasm for carbon markets, largely due to disappointing outcomes in the European Union's Emissions Trading Scheme (EU ETS) and CDM. First, the collapse of prices for certified emissions reduction (CER) credits in the EU ETS, by virtue of being the front-runner market, has set off domino effects in denting investor confidence in other carbon markets around the world that have been looking to the EU ETS for international best practices as well as market signals. Second, carbon crediting mechanisms have hardly performed better than trading schemes, with the CDM coming under intense scrutiny for having sapped a huge amount of development funding without necessarily having proved real, lasting, consistent emissions reduction. With both crediting and trading schemes taking big hits from detractors at Doha, it has become clear that market-based mechanisms for reducing carbon emissions have not been functioning as well in practice as in theory.

Critics of CDM have argued that the theory behind offset calculations, whereby reductions by one entity may be sold for use by another entity, is in principle a zero-sum game where total reductions for the atmosphere may not necessarily decrease at all.[16] Furthermore, concerns about how to sufficiently prove the additionality of CDM projects have compounded doubt about the credibility of the crediting mechanism in reducing or removing emissions where they may not have otherwise occurred.[17] Quite pessimistically, the report by the Stockholm Environment Institute (SEI) on New Market Mechanisms (NMM) concludes that, after so many years, there is still no conclusive evidence that CDM, as a whole, is leading or likely to lead to surplus emissions reductions in and of itself.[18]

Most damagingly, the low value of carbon credits under EU ETS has greatly dented the financial health of carbon markets everywhere, as

the vast majority of carbon credits have transacted through this largest ETS in the world. In 2011, trading volume in EU ETS reached 7.9 billion tonnes of carbon dioxide (CO_2; or, 77 per cent of the global trading volume of 10.3 billion tonnes) for a total value of EUR 106 billion.[19] Between the peak EU ETS carbon price of roughly EUR 30 per tonne of CO_2 in 2008 and the current price of around EUR 5 per tonne,[20] carbon market proponents around the world have struggled to sustain investor interest in a market flush with a huge over supply of carbon credits that are worth too little to motivate industry emissions reduction efforts. To make matters worse, in efforts to boost the present value of carbon credits, EU ETS now permits only least developed countries (LDCs) to continue selling credits generated by CDM into the EU scheme. This now effectively excludes middle-income countries, such as Indonesia and Thailand, which had formerly relied on EU ETS as the main market for any generated CDM credits.

So, why have Indonesia and Thailand continued to develop carbon markets? Besides the pressure from international climate change movements to limit global temperature increase to the 2°C ceiling necessary to set global emissions on a sustainable path[21], emerging countries, such as Indonesia and Thailand, are increasingly being confronted with domestic pressures to address the very real environmental problems happening right at home — such as poor air quality and severe land degradation — as a result of large-scale industrialisation, rapid urbanisation and increasing fossil fuel consumption in their growing economies. The necessity to engage industry sectors responsible for the bulk of CO_2 emissions means that local governments must continue to devise carbon reduction policies and programmes that are capable of triggering widespread industry participation via positive market signals. In this context, the direction of carbon market development in Indonesia and Thailand is increasingly turning away from EU ETS and towards bilateral crediting initiatives supported by international donors and domestic initiatives that emphasise the integration of local emissions reduction efforts. The following sections examine these recent carbon market developments in detail.

3. Recent Developments in Indonesia's Carbon Market

3.1 Overview

Indonesia's efforts to curb carbon emissions in recent years have seen small and large-scale carbon reduction programmes progress and stall as the government strives to formulate a cohesive climate change agenda in the context of rapid economic development and successively changing policy frameworks. Indonesia has actively engaged in the UNFCCC since presenting its First National Communication in 1992, and subsequently ratifying the Kyoto Protocol in 2004. According to Presidential Regulation No. 61/2011, the Indonesian government aims to reduce carbon emissions by 26 per cent in 2020 relative to business-as-usual baselines.[22] In the recent decade, Indonesia has participated in a number of international and national carbon market development programmes, including CDM, REDD+ and JCM, as well as commenced a pilot on a voluntary domestic carbon-trading scheme called Nusantara Carbon Scheme (NCS hereafter). Table 2.1 breaks down the four main carbon market mechanisms that Indonesia has introduced by their design elements.

Table 2.1: Four main carbon market mechanisms in Indonesia.

Design	CDM	REDD+	JCM	NCS
Type of mechanism	Crediting	Crediting	Crediting	Crediting and trading
Status	Active since 2004	Active since October 2009	Signed 26 August 2013; feasibility studies in progress; full implementation scheduled for 2015	In design phase
Coverage	Greenhouse gas emissions	CO_2 equivalent	CO_2	CO_2
Scope	International (multilateral)	International (multilateral)	International (bilateral)	Domestic
Target sectors	Various, but most projects in methane avoidance (67/146 registered projects)[23]	Forestry/land	All, including REDD+	Power and cement; also supports land use conversion and REDD+
Allocation	NA	NA	NA	Free
Crediting	Baseline and credit	Baseline and credit	Baseline and credit	TBC
Accreditation	UNFCCC	UN-REDD+	Japan government	DNPI

Monitoring, review, evaluation	International standards: VCS	National Forest Monitoring Systems using IPCC guidelines; verification goes through ICA by Annex I and non-Annex I parties	JCM projects must meet criteria of third-party entities accredited by the National Standard Bureaus of Japan or Indonesia, or otherwise be certified ISO 14065 or a former CDM DOE[24]	Comparable with CDM; based on ISO 14064 and ISO 14065, with added mandatory and verifiable sustainable development criteria**
Target buyers for credits	International	International	Japanese government	Domestic firms
Number of projects to date	215 projects approved, 146 registered, 37 projects credited (as of November 2014)	3 pilots completed in 3 provinces in 2014; 11 pilots targeted for 2015	5 projects selected for financing by Japan government	9
Carbon credits issued to date	10 $MtCO_2$; 10,097 CERs issued (as of November 2014)	NA	NA	Over 2.8 $MtCO_2e$[25]
Local administrator(s)	NC-CDM (KOMNAS-MPB) is the DNA	BP REDD+ (created October 2013; disbanded 21 January 2015)	Joint JCM Secretariat, CMEA Indonesia (with Japanese government)	DNPI, disbanded 21 January 2015
Financial incentives	International funding, Indonesian government incentives for foreign direct investments in certain energy sectors	International funding	Japanese government provides 50% of project start-up cost	In discussion
Major funders	Developed (Annex I) countries	Kingdom of Norway; GCF (UNFCCC)	Japanese government, Indonesian JCM Secretariat	Indonesian government, World Bank (PMR)
Funding source (Budget*)	Variable according to project	USD 1 billion pledged by Norway; GCF aims to raise USD 100 billion each year by 2020, but so far only a fraction of that amount has been raised	Not available; besides funding 50% of the capital cost of every project, Japan also provides technical support	USD 6.95 million (domestic); USD 3 million (PMR)[26]

BP REDD+ = National Reducing Emissions from Deforestation and Forest Degradation Agency; CDM = Clean Development Mechanism; CER = certified emissions reduction; CMEA Indonesia = Coordinating Ministry for Economic Affairs of Indonesia; CO_2 = carbon dioxide; DNA = Designated National Authority; DNPI = National Climate Change Council; DOE = Designated Operational Entity; GCF = Green Climate Fund; ICA = International Consultation and Analyses; IPCC = Intergovernmental Panel on Climate Change; ISO = International Organization for Standardization; JCM = Joint Crediting Mechanism; $MtCO_2$ = million tonnes of carbon dioxide; $MtCO_2e$ = million tonnes of carbon dioxide equivalent; NA = not available; NC-CDM = National Commission on CDM; NCS = Nusantara Carbon Scheme; PMR = Partnership for Market Readiness; REDD+ = Reducing Emissions from Deforestation and Forest Degradation; TBC = to be confirmed;

UNFCCC = United Nations Framework Convention on Climate Change; UN-REDD+ = United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries; VCS = Verified Carbon Standard

* Known budgets from author's research only.

** Defined in Appendix 2.2.

Looking across the board at Indonesia's four main carbon market mechanisms, the mechanism that had the highest level of government appointed to oversee its operationalisation in-country was, until very recently, REDD+. In 2013, a ministerial-level REDD+ agency (National Reducing Emissions from Deforestation and Forest Degradation Agency; or, BP REDD+) was established to administer and monitor the country's REDD+ activities that directly reported to the President, highlighting the importance the country's top policymakers attributed to reducing emissions from deforestation and land conversion. However, in January 2015, the incumbent President Joko Widodo disbanded not only BP REDD+ but also the National Climate Change Council (DNPI), the latter of which had been chaired by the President and tasked with advising and overseeing the implementation of policies relating to climate change adaptation and mitigation (Presidential Regulation No. 46/2008).

From 21 January 2015, both BP REDD+ and DNPI are now merged under a joint Ministry of Forestry and Environment via the new Presidential Regulation No. 16/2015. The intention behind this move is to streamline government administration by unifying all climate-related taskforces under a common ministry and objective. However, the flip side of this grand merger is that it has shaken the foundation of at least two of Indonesia's key emerging carbon market mechanisms — REDD+ and NCS. At the time of writing, the status of many former staff from BP REDD+ and DNPI was in limbo, and a former leader of NCS development at DNPI had left the ministry to work in a new non-governmental organisation (NGO), adding that he was uncertain about what would happen to NCS.[27]

While REDD+ and NCS are the most recent carbon market mechanisms to encounter development hurdles in Indonesia, they are not the only ones. The longest running of Indonesia's carbon market mechanisms — the CDM — has already been stalling for some time. While it may seem from the numbers in Table 2.1 that there are many CDM projects in progress, and generating a larger number of CER credits relative to other market mechanisms active in the country, it must be noted that the progress of Indonesia's CDM market has, in fact, fallen quite short of its potential. Between the launch of CDM in 2004 and November 2014, only 37 CDM projects have issued CER credits out of 215 projects approved by the National Commission on CDM (NC-CDM; or, KOMNAS MPB). The proliferation of CDM projects in Indonesia has mainly occurred between 2008 and 2011. After that, the collapse of CER credit prices under CDM has just about ground new projects to a halt. Since 2012, the Indonesian government has instead redirected the bulk of its carbon credit generation efforts towards REDD+ and JCM. The following sections examine Indonesia's various carbon market developments in greater detail.

3.2 CDM status

Indonesia has been active in CDM projects since 2004. As of November 2014, the Designated National Authority (DNA) for CDM (i.e., KOMNAS MPB) has approved 215 projects, with the majority concentrating in the biomass and waste sectors.[28] Of the approved projects, 146 are registered but only 37 have issued CERs for roughly 10 million tonnes of CO_2.[29] Moreover, comparing CDM data from March 2013, where 212 projects had been approved, 128 projects registered and 28 projects issuing CERs[30] up to that point, it appears that DNA has scarcely approved new projects in the previous year — only three — although it has registered and processed credits for a number of projects already in the pipeline.

The fact that the majority of approved CDM projects in Indonesia have targeted biomass and waste reflects the experience that these project types are easier and cheaper to implement compared to those that demand more advanced technologies or equipment (such as renewable energy) or require more capacity and consensus-building activities with local stakeholders (such as forestry projects). Previous studies have pointed out that certain types of CDM projects can demonstrate net benefits or additionality with relatively greater certainty — for example, projects that reduce emissions from industrial gases (such as hydrofluorocarbon-23 and nitrous oxide) or manure management, and perhaps, to a lesser extent, those that capture methane at landfills and coal mines.[31]

However, the financial attraction of Indonesia's CDM market has been seriously hindered by low demand and low prices of CER credits. According to Miyaguchi and Shaw's study on private sector engagements in CDM projects in Indonesia, '74% (37 projects) of the CDM projects in Indonesia can [sic] described as purely motivated by the desire to make profit, 18% by CSR/PR considerations and 8% by international emissions reduction obligations'.[32] In this vein, it is not surprising that the drop of CER value from roughly EUR 30 per tonne of CO_2 equivalent in 2008 to less than EUR 5 in 2012[33] has been accompanied by a dramatic drop in new project approvals, from an average of 37 projects per year between 2008 and 2012 to just three in 2013 and none at all in 2014.[34] As earlier noted, the fate of CDM in Indonesia was sealed when EU ETS — the main CDM market in the world — amended its rules to allow its Annex I country participants to buy credits only from LDCs during its third trading phase (2013–2020), effectively excluding Indonesia and all other ASEAN countries.[35]

With the above considerations in mind, Indonesia's turn towards REDD+ and JCM projects in 2013 can, in part, be interpreted as efforts to bolster investments in projects with high emissions reduction potential, and project types that are underserved by CDM, more likely to secure or even guarantee future buyers for generated credits (such as those pertaining to forestry activities [i.e., REDD+]), or those that deal with

energy efficiency improvement or fuel switches that require significant upgrades in technology, which may be supplied by development partners who can avail this expertise (for e.g., Japan through the JCM).

3.3 Proliferation of REDD+ activities

REDD+ is the largest carbon market in terms of emissions reduction potential in Indonesia given the sheer amount of carbon stored in the country's 120 million hectares (ha) of forest resources, which is estimated to hold around 60 gigatonnes (billion tonnes) of carbon.[36] According to a 2010 study by DNPI, deforestation and decomposition of peatland are the largest contributors by far to Indonesia's GHG emissions, with peatland and forestry emissions, respectively, accounting for a whopping 41 per cent and 37 per cent — or, altogether 85 per cent — of the country's total emissions.[37] Given the high intensity of GHG emissions generated by palm oil production, and forest and peatland conversion activities in Indonesia, REDD+ initiatives that focus on reducing emissions in this particular sector can be critical in helping the country achieve its target of reducing GHG emissions by 26 per cent by 2020.

However, it is important to point out that Indonesia's REDD+ market to date has largely blossomed upon international aid and donation pledges, and does not yet function as a liquid market in and of itself. REDD+ projects have been piloting in Riau, and East and Central Kalimantan since 2009, with generous technical and financial support from a number of research organisations and international donors. Among the biggest international donors are Norway, the UN and Australia. In the first years of REDD+ in Indonesia, major international donors were primarily the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD), World Bank (through the Forest Carbon Partnership Facility [FCPF] and Forest Investment Program [FIP]), and various development agencies from Australia and the US. However, in 2010, Norway pledged the largest amount of international funding that Indonesia had seen in its REDD+ efforts to date.

In a partnership with the Government of Indonesia, the Kingdom of Norway has committed USD 1 billion to support efforts to reduce GHG emissions from deforestation as well as degradation of forest and peatlands. In a letter of intent signed between the two governments on 26 May 2010[38], it was stipulated that the Norwegian funding would help Indonesia build a national REDD+ strategy in 2010 and thereafter continue to distribute funds over the next seven or eight years depending on Indonesia's performance in achieving verified emissions reductions. By tying USD 1 billion to qualifying REDD+ projects, Norway has improved the financial attractiveness of REDD+ projects by pledging to pay for Indonesian forest carbon so long as the reduction outcomes meet funding stipulations. As part of the letter of intent originally agreed between the Indonesian and Norwegian governments, Indonesia should 'establish a special agency reporting directly to the President to coordinate the efforts pertaining to the development and implementation of REDD+' which, at least between 2013 and January 2015, Indonesia did adhere to by creating BP REDD+ (Presidential Decree No. 62/2013).[39] Following the dissolution of BP REDD+, the Norwegian Ambassador to Indonesia, Stig Traavik, has commented that Norway would be open to some changes in the nature of the two countries' cooperation on REDD+ activities, so long as the end goal of REDD+ remains the same.[40]

Overall, REDD+ activities have proliferated at remarkable speed since 2010. Following the conclusion of the first REDD+ pilots in three provinces, BP REDD+ has aimed to expand REDD+ pilots to 11 provinces across Indonesia by the end of 2015, and they will continue with this goal via the Ministry of Forestry and Environment.

The challenge now is for the Indonesian government to take leadership of REDD+ and continue to support the growth of the forest carbon market by establishing certainty and continuity of this policy direction. Now that BP REDD+ has been absorbed into the Ministry of Forestry and Environment, BP REDD+ no longer reports directly to the President but rather acts as an advisory board to a new Directorate General (DG) of Climate Change within the Ministry.[41] This structural reorganisation

does not necessarily mean that REDD+ actions will take a step back; in fact, it is possible that the coordination and oversight of REDD+ activities can be further streamlined under the merged Ministry of Forestry and Environment. The important part now is for the Ministry to nail down a framework for progressing with REDD+, along with forestry and environmental planning, to assure the public and private sectors that the new government continues to be serious about climate change. However, as of 4 February 2015, the DG for Climate Change had not yet been staffed.

While the government-led expansion of REDD+ pilots across the country would not necessarily signify that a functioning market for selling and buying REDD+ credits will follow in line — and it has not, so far — it does nevertheless send a market signal to project developers and investors that the government is committed to fostering this initiative, which can help revive private sector interest in participating along the various segments of the forest carbon economy. Increased private sector contributions from project planning to implementation, data building and monitoring are all essential to realise a true market for forest carbon credits, no matter when it may come.

3.4 JCM

Indonesia has signed on to Japan's JCM as a partner country in the summer of 2013 and established a JCM Secretariat in Jakarta later that same year.[42] Through the JCM, Japan contributes funding and technical assistance to approved carbon-offsetting projects in 11 partner developing countries — of which Indonesia is the dominant partner — on the condition that these projects will generate offset credits for the Government of Japan from 2014 onwards for Japan's Copenhagen pledge. According to Japan's submission to the UNFCCC under FVA: 'The JCM aims at facilitating diffusion of leading low carbon technologies, products, systems, services and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries'.[43]

JCM is intended to complement the CDM and help contribute to the UNFCCC's overall objective of facilitating emissions reductions on a global scale. Indonesia and Japan both have their own national emissions reduction targets, which JCM projects can help to meet and perhaps, more effectively than CDM, have managed. According to a report by the UN, the Japanese government 'strongly supports' the JCM's bilateral approach because it is 'put off by the high regulatory intensity of the CDM process and now hopes for easily accessible export subsidies for Japanese technology'[44].

Japan's submission to the UNFCCC on FVA confirms that Japan advocates 'conservativeness in calculating the amount of emission reductions or removals'[45], whereby emissions reductions that qualify for crediting are either 'calculated as the difference between the reference emissions and the project emissions' or 'calculated as the difference between [business-as-usual] emissions and the project emissions calculated in a simple and conservative manner'[46]. A senior representative at the JCM Secretariat in Jakarta agrees that a key strength of the JCM relative to other carbon market mechanisms is that JCM is simpler to implement with its lower criteria for qualifying projects.[47] In brief, both Japan and Indonesia support the position that emissions reductions targets can function even with conservative expectations. Indonesia's JCM programme has already begun piloting feasibility studies, implementation projects and supporting programmes with the expectation that JCM will be in full force in 2015.

As of December 2013, five of 10 JCM projects that had been selected for financing under the JCM Promotion Scheme are in Indonesia[48], signalling the importance of Indonesia as a development partner for Japan. Of the other five projects selected by Japan elsewhere in the developing world, two are situated in Vietnam, one in Cambodia, one in Bangladesh and one in Mongolia. As elaborated later in this article, the dominance of ASEAN-based JCM projects signals the region as a priority for the Japanese government in the context of international carbon market development and development assistance. Besides helping Japan achieve its 2020 emissions reduction target, JCM is also

used by Japan as a vehicle for developing first-mover advantage in export markets for Japanese technologies and firms.[49] Insofar as Indonesia is eager to gain funding and technical capacity to scale up low-emission projects, it would appear that a bilateral crediting solution with a high-technology partner-investor, such as Japan, would make JCM a mutually beneficial joint venture. Through JCM, both countries could invest in projects that contribute to national emissions reduction targets while growing their respective export markets — Indonesia in exporting carbon credits directly to a guaranteed buyer, Japan, and Japan in exporting technologies to a strategic trade partner.

In a nutshell, JCM essentially extends from the lessons of CDM to not only help developing countries invest in emissions reduction projects that can generate credits to supply the carbon market but also guarantees that market by ensuring demand. However, due to its bilateral nature, JCM is simpler in administrative procedures than the multilateral CDM administered by the UNFCCC at an international scale. Furthermore, unlike CDM, JCM is open to any low-carbon technology in a wider range of sectors, including transport, energy efficiency, renewable energy, waste and REDD+. Ultimately, Japan argues that this bilateral mechanism will deliver projects faster and more easily than CDM while simultaneously reducing transaction costs and attracting more private sector engagement.[50]

JCM would ideally scale up as an international carbon offset scheme, and while trading in the future is considered as an option in the first version of JCM's rules for implementation[51], the JCM Secretariat in Jakarta does not anticipate trading in the near term (before or even in 2020).[52]

3.5 Voluntary carbon trading programme: NCS

As mentioned previously, Indonesia has introduced a voluntary offset and crediting scheme called NCS, which is intended to facilitate the transition to emissions trading. In NCS, 1 UKN (Nusantara Carbon Unit) per tonne of verified CO_2 reduction is granted to qualifying projects. According to DNPI, the four main objectives of the domestic NCS are to:

> 1) Maintain the mitigation/carbon market momentum in Indonesia; 2) Incentivise mitigation actions, especially micro- and community-based ones; 3) Improve national capacity to undertake mitigation actions with appropriate monitoring, review and verification (MRV); 4) Position climate change mitigation as an agent of sustainable development.[53]

NCS has been in development since 2012 and, until January 2015, was managed by the now-disbanded DNPI. As of March 2015, the official NCS website is no longer functioning, and there is uncertainty about whether or how the scheme will continue.[54] However, given that NCS was one of the key carbon market development activities that was repeatedly promoted by DNPI at high-level international platforms, such as the UNFCCC, and in collaboration with the Institute for Global Environmental Strategies (IGES) as well as in consultation with the World Bank, dropping the scheme at this point would certainly damage Indonesia's credibility in terms of seriously engaging in carbon market development initiatives. Furthermore, it should not be overlooked that DNPI has received USD 3 million in funding to carry out various carbon market readiness activities between 2015 and 2018[55], and so it should be expected that the Indonesian government would allocate the appropriate resources to take over DNPI's duties under the merged Ministry of Forestry and Environment.

As such, it bears noting the latest progress of NCS prior to the disbanding of DNPI. At the time of research, NCS was still in the design phase, with DNPI in the process of evaluating international standards and emissions calculation formulas for feasibility in the Indonesian context, while keeping in mind that the NCS scheme must be sufficiently adapted to the local context to fit in with a number of existing and ongoing GHG policies in Indonesia. Like many other carbon schemes around the world, NCS had opted to start from a credit and registration programme that would transition to a trading scheme. NCS has offered free allocation of initial credits to firms that volunteer to join the carbon trading market, although the power and cement sectors had been identified as priority target sectors. DNPI had originally targeted to introduce the NCS pilot programme in late 2014, but this was put on hold while the government

streamlined its climate-related ministries and realigned its objectives in emissions reductions.[56]

4. Recent Developments in Thailand's Carbon Market

4.1 Overview

Thailand is also developing domestic and international carbon market mechanisms (Table 2.2). As with carbon markets elsewhere, Thailand's main challenge is to generate and sustain demand in carbon credits. As of 2013, Thailand Greenhouse Gas Management Organization (TGO) has launched three flexible voluntary market-based mechanisms — Thailand Carbon Offsetting Program (T-COP), Thailand Voluntary Emission Reduction (T-VER) Program and Thailand Voluntary Emissions Trading Scheme (T-VETS). T-COP is intended to generate demand for T-VER and T-VETS is intended to be elaborated upon after 2015 following experiences from other market-mechanism supporting activities, such as the Energy Performance Certificate Scheme (EPC), Low Carbon City (LCC) programme and Thailand's own Nationally Appropriate Mitigation Actions (NAMA) focused on the energy sector.

Table 2.2: Four main carbon market mechanisms in Thailand.

Design	CDM	T-COP	T-VER	T-VETS
Type of mechanism	Crediting	Crediting	Crediting	Trading
Status	Active since 2004	Active since March 2013	Active since October 2013	To be launched in October 2014
Coverage	Greenhouse gas emissions	CO_2 equivalents	CO_2, CH_4, N_2O	Energy-related CO_2
Scope	International	Domestic	Domestic	Domestic
Target sectors	Various	Forestry/land	All, project-by-project basis	All, but primarily industrial sector (power, petrochemical, iron and steel)
Allocation	NA	NA	NA	Grandfathering in pilot phase, potential revision(s)
Crediting	Baseline and credit	Offset credit	Baseline and credit	Allowances
Accreditation	UNFCCC	TGO	TGO	TGO

Monitoring, review, evaluation	International standards	-	Domestic; best practices from CDM[57]	ISO 14064-1, ISO 14064-3, ISO 14065
Target buyers for credits	International	Domestic firms and individuals	Government, CSR companies, brokers	Entities and traders
Number of projects to date	147 registered, 37 received CERs[58]	10 projects, 200 individuals	-	NA
Carbon credits issued to date	2.88 $MtCO_2e$ (as of June 2013)[59]	3,514 $MtCO_2e$ (as of April 2014)	-	NA
Local administrator(s)	-	TGO	TGO	TGO
Financial incentives	International funding	Potential subsidies and tax exemptions (in negotiation)	Potential subsidies and tax exemptions; international funding	International funding; TRF
Major funders	Developed (Annex I) countries	Thai government	Thai government, World Bank	Thai government, World Bank; TRF
Budget*	Variable according to project	-	-	Phase I: USD 5.79 million (domestic); USD 3 million (PMR) Phase II: USD 3.8 million (domestic); USD 2 million (PMR)

CDM = Clean Development Mechanism; CER = certified emissions reduction; CH_4 = methane; CO_2 = carbon dioxide; CSR = corporate social responsibility; ISO = International Organization for Standardization; $MtCO_2e$ = million metric tonnes of carbon dioxide equivalent; N_2O = nitrous oxide; NA = not available; PMR = Partnership for Market Readiness; T-COP = Thailand Carbon Offsetting Program; T-VER = Thailand Voluntary Emission Reduction; T-VETS = Thailand Voluntary Emissions Trading Scheme; TGO = Thailand Greenhouse Gas Management Organization; TRF = Thailand Research Fund; UNFCCC = United Nations Framework Convention on Climate Change

* Known budgets from author's research only.

According to a spokesperson at TGO, the main incentive driving the progress of T-VER, T-COP and T-VETS is the desire of major industries to tout a green corporate image.[60] However, corporate social responsibility (CSR) in Thailand is as yet a luxury concept reserved for very large or multinational companies and, as such, is not particularly concerning to the vast majority of smaller industries in the country. In short, current uptake of the TGO's voluntary emissions reductions initiatives is limited at best. However, TGO is experimenting with a number of different crediting and offsetting approaches intended to generate demand for the Thai carbon market. It also hopes to negotiate with tax deductions and/or other subsidies for private sector companies to prompt more among them to join Thailand's voluntary carbon market.

Thailand is also interested in joining the JCM. According to TGO, which is responsible for developing voluntary ETS, political disruptions in the country have been a cause of delay in signing the JCM agreement with Japan.[61]

4.2 Creating demand for carbon credits through T-COP and T-VER

T-COP is a domestic voluntary carbon offsetting programme that offers certificates for individuals, companies, products or events that wish to offset their GHG emissions. Individuals can calculate on the TGO website the amount of GHG they emit each year from daily activities — such as travelling or going to work — and thereafter contact designated carbon credit providers to buy the appropriate number of credits from them. There is no verification process in place for individuals who participate in T-COP. However, for products, organisations and events, a designated third party verifier registered with TGO must verify the carbon credits. Once the carbon offset of a product, organisation or event has been verified according to TGO guidelines, they can then display a label certifying their carbon offset or carbon neutrality.

However, the scale of interest in T-COP is currently limited. As of April 2014, only 10 T-COP verifiable certificates have been issued to six products, two organisations and two events for a total of 2,441 tonnes of CO_2 equivalent.[62] As for individuals who wish to purchase carbon offsets for their self-reported carbon footprint, 200 T-COP certificates have been issued for a total of 1,073 tonnes of CO_2 equivalent.[63]

According to TGO, although the Thai carbon market is open to firms from all sectors that volunteer participation[64], it is primarily the big industrial corporations that are interested in this programme in order to enhance their CSR branding.[65] As voluntary participation has been limited so far, TGO wishes to encourage broader participation by negotiating potential incentive schemes with other Thai administrative agencies. One incentive currently under discussion between TGO and Thailand's revenue department is tax exemption on the revenue that suppliers receive

from selling CER credits.[66] TGO is also working with Thailand's Fiscal Policy Office (FPO) to explore the possibility of giving tax reductions or exemptions to buyers of carbon credits, akin to tax exemptions on donations. The idea is that, if these incentives successfully get enacted, then companies that volunteer to join T-COP and T-VER can receive a tax rebate.[67] However these incentives are still under negotiation with the Ministry of Finance.

4.3 T-VETS

The TGO is also working to establish a domestic voluntary ETS, called T-VETS, which will allow interested firms in the industrial sector to join a cap-and-trade carbon market. With technical and financial support from the World Bank's Partnership for Market Readiness (PMR), the TGO hopes to merge two programmes — LCC and EPC — to create T-VETS. In the LCC programme, local administrative offices use T-VER methodologies to calculate carbon credits that are generated from GHG emissions reduction projects.[68] The EPC programme issues certificates for energy efficiency in the power and industrial sectors, such as those in manufacturing, commercial and thermal power plants. Thailand's EPC programme in the PMR will end in 2017, and thereafter TGO will decide if and how it will transform EPC to T-VETS.[69] That is to say, although T-VETS targets a launch for 2015, a larger scale deployment beyond test pilots will only occur in the presence of suitable market conditions following an assessment of EPC and other programmes after 2017.

5. Voluntary Markets as Necessary Process

A review of recent developments in carbon market mechanisms in Indonesia and Thailand suggests that this is a space of opportunism, where progress hinges on the ebbs and flows of the surrounding financial environment. It seems intuitive that higher guarantees of buyers of carbon credits will induce more carbon market activities, or that voluntary carbon offsetting schemes, which involve extra costs and efforts, are not necessarily appealing to profit-driven firms. However, as Benwell argues in his study on voluntary ETS, emissions trading markets have

always developed over time, revising and updating themselves again and again in the face of new market conditions, negotiations and entrants.[70]

Benwell points out several examples where voluntary ETS have contributed to building momentum towards regulated markets in the US and Japan by gradually accumulating awareness, support and technical capacity to advance carbon market development.[71] In this sense, it would appear simplistic to assign presumptions about the effectiveness of voluntary carbon markets as the polar opposite of their mandatory counterpart when they should be viewed along a continuum of progress. Taking the low participation in Thailand's T-COP as an example, while only 10 companies have volunteered to participate in this offsetting scheme so far, the scheme itself has nevertheless been designed with a carbon development trajectory in mind — that is, to generate awareness and interest in T-VER, which will also contribute to the development of an ETS down the line. Thereafter, depending on the progress of the voluntary ETS, a mandatory ETS may be more likely to come into fruition. First, as all carbon market authorities will say, there needs to be stimulus for rallying support for emissions trading and for developing the relevant technical and financial infrastructure to advance carbon market platforms.

6. Potential for Regional Linkages

6.1 Implications for other carbon markets in ASEAN

How do the carbon market developments in Indonesia and Thailand relate to those in neighbouring ASEAN countries? Of the NMMs under consideration in the UNFCCC's FVA, REDD+ and JCM stand out as being the most promising carbon market mechanisms for scaling up in ASEAN.

In terms of potential CO_2 coverage, the REDD+ programme has the broadest span across ASEAN countries already involved. Four of 10 ASEAN member states currently have UN-REDD National Programmes — Cambodia, Indonesia, the Philippines and Vietnam. Additionally,

three more member states — Laos, Malaysia and Myanmar — are partner countries in UN-REDD. Many more are engaged in REDD+ development activities led by other local or international organisations, such as FCPF, the German international development agency GIZ (or, German Agency for International Cooperation) and World Wildlife Fund (WWF). Increasingly, diverse organisations are working together across borders to examine approaches towards developing REDD+ linkages. The partnership between WWF and Forest Carbon, an Indonesian consultancy firm, to explore a transboundary REDD+ conservation project between Central Vietnam and southern Laos is one such example.[72]

JCM also appears to be gaining traction as an alternative approach to contributing to the ultimate UNFCCC objective of facilitating global emissions reductions for a number of countries in Southeast Asia. JCM offers more straightforward bilateral cooperation that supports the full-cycle supply and demand flow of carbon credits between two countries. Compared to EU ETS, which has witnessed multiple carbon market stakeholders oversupply the European market with low-priced credits, or CDM, which has imposed high qualifying criteria that developing countries have struggled to meet, a relatively simpler two-way crediting mechanism, such as JCM, has high potential to wedge its influence on emerging carbon markets by helping developing countries build up capacity where autonomous emissions trading may not yet be technically or economically viable.

Of the 10 ASEAN member states, four are already signatories to JCM — Indonesia, Vietnam, Laos and Cambodia. Should Thailand join as well, half of all ASEAN countries would be building their carbon markets with assistance from Japan. This is not without strategic implications for Japan, which has been developing this carbon market mechanism with significant funding with a view on long-term opportunities.

Between 2010 and 2011, Japan allocated approximately USD 108 million to promote JCM, with the Ministry of Economy, Trade and Industry (METI) and the Ministry of Environment funding feasibility studies for pilot projects in target countries.[73] As of end 2015, 112 projects and

studies have commenced in various participating countries under JCM, with 72 (or, 64 per cent) of them based in Southeast Asia.[74] Currently, the Government of Japan is in the process of setting up the appropriate registry infrastructure for JCM.

As for a potential ASEAN carbon trading market, it is unlikely to emerge in the near term. Indonesia's NCS is paused until further notice and Thailand's ETS will be piloted from 2015 with uptake by industry generally expected to take much longer.[75] For Indonesia and Thailand, the likelihood of scaling up voluntary carbon market developments will depend significantly on the political and financial circumstances for non-Annex I (or, developing) countries in the next round of UNFCCC negotiations in 2020, when the time comes to negotiate the next steps in the Kyoto Protocol.

In the meanwhile, climate negotiations continue on the path towards Paris COP21 (21st session of the Conference of the Parties [COP] to the UNFCCC). Notably, the US-China joint agreement on climate change, signed in November 2014, has signalled a willingness to collaborate between two major 'developed' and 'developing' emitters, who have committed strong measures to reduce emissions while still retaining the principle of common but differentiated responsibility. However, it remains to be seen whether the other G77 members — including Southeast Asian nations — will view China's move as a leading example for developing countries to pronounce firmer emissions reduction targets at the international level, or as leverage to pressure developed countries to adopt more stringent targets and contribute more climate financing to support global emissions reduction efforts now that they can no longer claim low engagement from China.

What is certain is that, following Lima COP20 (20th session of the COP to the UNFCCC), the 193 member states in the UN have agreed to submit Intended Nationally Determined Contributions (INDCs) to meet post-2020 emissions reduction targets ahead of Paris COP21, where a new international climate change agreement is expected to be finalised. Indonesia and Thailand are both in the process of drafting INDCs, which

at this moment are expected to continue reflecting the countries' stance that developed countries should lead global emissions reduction actions with ambitious INDCs and higher funding contribution to the Green Climate Fund (GCF), particularly to support mitigation and adaptation activities in developing countries. So far, global contributions to GCF have barely cleared the initial capitalisation amount of USD 10 billion, or about 10 per cent of the USD 100 billion developed countries had committed to raise annually by 2020 in Cancun. Before ASEAN countries submit to more demanding emissions reduction efforts, they will certainly wait for developed countries to move first.

7. Conclusion

Overall, many challenges remain for carbon market development in Indonesia and Thailand. Firstly, in both Indonesia and Thailand — as well as in most ASEAN countries — economic growth, poverty reduction, income inequality and political reform continue to dominate development priorities. Therefore, carbon market development initiatives are unlikely to jump to a higher rung on their national agendas without significant improvements in the health and stability of their political economies. Moreover, skeptics questioning the value of carbon markets point to the oversupply and low prices of CER credits that have been generated from CDM projects, along with dubious emissions reductions and pervasive uncertainties about the future of the international carbon market following the end of the latest Kyoto commitment period in December 2012.

However, Indonesia and Thailand have nevertheless opted to explore the potential of carbon markets flexibly. An overview of recent developments in major carbon market mechanisms in Indonesia shows that the trends towards carbon market development in these countries are voluntary, flexible crediting or trading mechanisms that are supported by external funding — during set up as well as for demand — and ideally involving direct knowledge or technical transfers.

At the international level, Indonesia and Thailand want to be prepared to meet emissions reduction commitments if they should be required to do

so in the next round of UNFCCC negotiations. The two countries also want to be able to generate CER credits to sell to international buyers if there should be a demand for such credits in the future. The possibility to tap into future opportunities in the international carbon market requires building sufficient financial, technical and legal infrastructure to sustain carbon markets now. Learning from practice by experimenting with voluntary carbon market mechanisms — especially with the support of international funding — is an advantageous place to start for Indonesia and Thailand.

More importantly, these carbon markets have the potential to prosper irrespective of the outcomes of the next international climate negotiation. We see, in the case of JCM, a partnership where two countries can benefit from technology transfer (on the part of Indonesia) and technology export market (on the part of Japan) while accumulating carbon reduction credits that are insulated from the price shocks or demand volatility in the international carbon market. So long as both Indonesia and Japan commit to their own national emissions reduction targets — and both of them have established their own — there is no reason why a bilateral carbon mechanism, such as JCM, cannot serve that purpose in its own economic and political right.

The fact that Japan has established JCM partnerships with several other countries means that these opportunities can be multiplied. A similar argument can be made for the REDD+ agreement between Indonesia and Norway, whereby Norway has agreed to support serious and sustainable forest carbon reduction efforts in Indonesia with a USD 1 billion donation pledge that also helps to satisfy its own national emissions reduction target and international development aid agenda. Approximately USD 517 million has been pledged to Norway's International Climate and Forest Initiative (NICFI) each year, which helps fund numerous bilateral and multilateral REDD+ initiatives around the world.[76]

Ultimately, the more important elements in designing carbon market mechanisms are neither mandatory nor multilateral participation but the availability of scalable technological transfer and flexibility

for participating firms to sell credits through domestic, bilateral or international mechanisms. Suitably designed carbon market mechanisms can continue to deliver emission reduction results on a country-by-country basis, irrespective of external conditions in the international market.

APPENDICES

*Appendix 2.1: Existing and proposed carbon pricing schemes around the world.**

Country	Start year	Type	Coverage
European Union	2005	Cap and trade	11,500 installations, 40% total emissions
Alberta (Canada)	2007	Tradable Carbon Performance Standard, or contribute to government-run green fund[77]	All major industrial facilities producing ≥ 100,000 tonnes of greenhouse gases per year
British Columbia (Canada)	2008	Carbon tax	Fuels
New Zealand	2008–2020	Cap and trade	Industry, electricity, forestry, transport fuels, waste and synthetics, domestic aviation, industry
RGGI (US)	2009–2018	Cap and trade	Power
Tokyo (Japan)	2010	Cap and trade	Industry, commercial buildings
Saitama (Japan)	2011	Cap and trade	Industry, commercial buildings
India	2012–2015	PAT scheme[78]	Plant specific: power, thermal, fertilisers, paper, textiles, aluminium, iron and steel
Quebec (Canada)	2013–2020	Cap and trade (linked with California)	Industry, energy, fuels: 85% of total emissions
California (US)	2013–2020	Cap and trade (linked with Quebec)	Industry, energy, fuels: 85% of total emissions
China	2013–2020	Cap and trade	Variable by pilots
Kazakhstan	2013–2020	Cap and trade	Industry, electricity, fuels, chemicals, mining and metals, power
Switzerland	2013–2020 (since 2008)	Cap and trade, also has incentive tax[79]	Electricity, industry
Indonesia	2014	Cap and trade	Power, cement
South Africa	2015	Carbon tax	Industry with some exemptions
Korea	2015–2026	Cap and trade	Electricity, industry
Thailand	2015	Cap and trade; tax	Industry (ETS); auto (tax)

Rio de Janeiro (Brazil)	Under consideration	TBC	TBC
Mexico	Under consideration	TBC	TBC
Chile	Under consideration	TBC	TBC
Ukraine	Under consideration	TBC	TBC

ETS = Emissions Trading Scheme; PAT = Performance Achieve Trade; RGGI = Regional Greenhouse Gas Initiative; TBC = to be confirmed

* Australia's Carbon Pricing Mechanism (2012–2014) has been repealed and is therefore excluded from this table.

Source: Compiled by the author from Organisation for Economic Co-operation and Development (OECD)/International Energy Agency (IEA), World energy outlook 2013 (Paris: IEA, 2013), License: http://www.iea.org/t&c/termsandconditions/; International Emissions Trading Association (IETA) and Environmental Defense Fund (EDF), 'The world's carbon markets: A case study guide to emissions trading' (2014), http://www.ieta.org/assets/Reports/ieta%20timelines%20and%20targets%20of%20schemes.pdf; Thailand Greenhouse Gas Management Organization (TGO), 'Carbon market TGO', accessed 15 October 2014, http://carbonmarket.tgo.or.th/2013/thai/index.php; Dicky Edwin Hindarto, 'Nusantara Carbon Scheme (NCS): Indonesia first domestic emission reduction certification' (PowerPoint presentation, 2013), accessed 15 October 2014, http://www.iges.or.jp/en/archive/cdm/pdf/regional/20130306/4_Indonesia_Mr.Dicky.pdf.

Appendix 2.2: Indonesia's sustainable development criteria and indicators for NCS.

Category	**Indicator**
Environment	Local ecological function
	Quantity and quality of natural resources
	Biodiversity
	Health and safety
Economic	Income for community
	Jobs
Social	Access to public goods, facilities and services
	Social integrity
	Relocation impact
	Respect of culture

NCS = Nusantara Carbon Scheme

Source: Dicky Edwin Hindarto, 'Nusantara Carbon Scheme (NCS): Indonesia first domestic emission reduction certification' (PowerPoint presentation, 2013), accessed 15 October 2014, http://www.iges.or.jp/en/archive/cdm/pdf/regional/20130306/4_Indonesia_Mr.Dicky.pdf.

Appendix 2.3: T-COP participants (as of April 2014).

No.	Certificate no.	Participant type	Name	Unit (product)	Carbon footprint (tonnes CO2e)	Carbon offset (tonnes CO2e)
1	TCOP-13-P-001	Product	'COOK' 100% refined soybean oil, 1 L bottle	684,000 bottles	834.38	835
2	TCOP-13-P-002	Product	'COOK' 100% refined soybean oil, 0.5 L bottle	100,800 bottles	164.3	165
3	TCOP-13-P-003	Product	Brochure 'GreenPrint GO CARBON NEUTRAL'	3,000 copies	0.95	1
4	TCOP-13-P-004	Product	Brochure 'Global Responsibility Report Print City 2012'	2,500 copies	0.98	1
5	TCOP-13-P-005	Product	Sustainability report 2013	3,000 copies	8.68	9
6	TCOP-13-P-006	Product	Annual report 2013	4,000	19.64	20
7	TCOP-13-O-001	Organisation	Bangchak Petroleum PLC	NA	133,133.00	1,000
8	TCOP-13-O-002	Organisation	PRINT CITY CO, LTD	NA	38.00	38
9	TCOP-13-E-001	Event	2013 PTT Group SSHE AGM	NA	8.38	9
10	TCOP-13-E-002	Event	31st Annual Chamber of Commerce Conference at Trang Province	NA	362.17	363
11–211	NA	Individual	NA	NA	NA	1,073

CO_2e = carbon dioxide equivalent; NA = not available; T-COP = Thailand Carbon Offsetting Program; TGO = Thailand Greenhouse Gas Management Organization

Source: TGO database printout, obtained during interview with TGO representative, Bangkok, 22 April 2014.

Endnotes

1 ASEAN includes 10 member states — Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam.

2 A carbon market is a market that involves the trading of carbon emission allowances or credits to help countries or firms meet their emissions reduction targets.

3 Emissions Trading Schemes (ETS) are a flexible mechanism in the Framework for Various Approaches (FVA) in the United Nations Framework Convention on Climate Change (UNFCCC), but unlike Clean Development Mechanism (CDM), Reducing Emissions from Deforestation and Forest Degradation (REDD+) and Joint Crediting Mechanism (JCM), ETS facilitates the exchange of emissions credits to a secondary trading market beyond the buyer-seller dyad in crediting mechanisms.

4 The CDM is a flexible mechanism born out of the Kyoto Protocol that is intended to lower the cost of compliance with emissions reduction commitments while simultaneously increasing foreign investments in transferring technologies from developed countries (Annex I countries in the UNFCCC) to developing ones (non-Annex I countries). For example, a developed country can invest in a CDM project in a developing country, which can then generate certified emissions reduction (CER) credits that would count towards the developed country's national emissions reduction commitment at the UNFCCC. For more information on Annex I and non-Annex I countries in the UNFCCC, see United Nations Framework Convention on Climate Change (UNFCCC), 'List of Annex I parties to the Convention', http://unfccc.int/parties_and_observers/parties/annex_i/items/2774.php; United Nations Framework Convention on Climate Change (UNFCCC), 'List of non-Annex I parties to the Convention', http://unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php.

5 For more information, see Dang Hanh, Axel Michaelowa and Friso de Jong, 'From GHGs abatement potential to viable CDM projects: The cases of Cambodia, Lao PDR and Vietnam' (HWWA-Report No. 259, Hamburg: Hamburg Institute of International Economics [HWWA], 2006); Axel Michaelowa and Frank Jotzo, 'Transaction costs, institutional rigidities and the size of the Clean Development Mechanism', *Energy Policy* 33, no. 4 (2005): 511–23; Takaaki Miyaguchi and Rajib Shaw, 'CDM and its development impact: The role and behaviour of the corporate sector in CDM projects in Indonesia', in *Corporate responses to climate change: Achieving emissions reductions through regulation, self-regulation and economic incentives*, ed. Rory Sullivan (Sheffield: Greenleaf Publishing, 2008), 58–74; Karen Holm Olsen and Jørgen Fenhann, eds, A *reformed CDM — Including new mechanisms for sustainable development*, Perspectives Series 2008 (Roskilde: Forskningscenter Risø, 2008); Steven Lim and Keat Teong Lee, 'Leading global energy and environmental transformation: Unified ASEAN biomass-based bio-energy system incorporating the Clean Development Mechanism', *Biomass and Bioenergy* 35, no. 7 (2011): 2,479–90.

6 Richard Benwell, 'Voluntary aspects of carbon emissions trading', *International Journal of Environmental Studies* 66, no. 5 (2009): 605–18; Andi Tabrani, Roger Neil Lawrey and Janaki Ram Pillarisetti, 'Emissions trading and the potential benefits for ASEAN: Exploring the possibilities for Brunei Darussalam', *Journal of Sustainable Development* 5, no. 11 (2012): 46–55.

7. REDD+ is a third flexible mechanism also under consideration in the FVA. REDD+ projects offer incentives for developing countries to reduce or avoid emissions from deforestation and forest degradation activities by putting a financial value on forest carbon. A REDD+ project may be as simple as one in which a plot of rainforest is left intact (rather than cleared or converted for industrial purposes) to generate money according to the amount of carbon stored in the rainforest.

8. One exception is Tabrani, Lawrey and Pillarisetti's overview of the potential benefits of an ASEAN carbon trading market using Brunei Darussalam as a theoretical base. See, Tabrani, Lawrey and Pillarisetti, 'Emissions trading and the potential benefits for ASEAN', op. cit.

9 The Japanese government's JCM works like the CDM, but with only Japan investing in emissions reduction or removal projects in developing countries that Japan has signed agreements with. As its name suggests, the JCM is a bilateral crediting mechanism. It is also another flexible mechanism under consideration in the FVA in the UNFCCC.

10 For example, the European Commission's New Market Mechanism and the Regional Greenhouse Gas Initiative (RGGI) consider sectoral trading.

11 For a list of ETS currently implemented or under consideration around the world, see Appendix 2.1. For a map of ETS, see: International Carbon Action Partnership (ICAP), 'ETS map', http://icapcarbonaction.com/ets-map.

12 Jos G. J. Olivier et al., 'Trends in global CO_2 emissions: 2013 report' (Background Studies, The Hague: PBL Netherlands Environmental Assessment Agency, 2013); World Bank and Ecofys, 'Mapping carbon pricing initiatives: Developments and prospects' (Washington, D.C.: Carbon Finance at the World Bank, 2013).

13 Benwell, 'Voluntary aspects of carbon emissions trading', op. cit.; Jody Freeman and Charles D. Kolstad, eds, *Moving to markets in environmental regulation: Lessons from thirty years of experience* (Oxford: Oxford University Press, 2007); Olivier et al., 'Trends in global CO_2 emissions', op. cit.; Tabrani, Lawrey and Pillarisetti, 'Emissions trading and the potential benefits for ASEAN', op. cit.; T. H. Tietenberg, *Emissions trading: Principles and practice*, 2nd ed. (Washington, D.C.: Resources for the Future, 2006); World Bank and Ecofys, 'Mapping carbon pricing initiatives', op. cit.

14 Freeman and Kolstad, *Moving to markets in environmental regulation*, op. cit.

15 Tietenberg, *Emissions trading*, op. cit.

16 Karen Holm Olsen, 'The Clean Development Mechanism's contribution to sustainable development: A review of the literature', *Climatic Change* 84, no. 1 (2007): 59–73; Michael Lazarus et al., 'Potential for international offsets to provide a net decrease of GHG emissions' (SEI Working Paper 2013–06, Somerville: Stockholm Environment Institute [SEI], 2013).

17 The concept of project 'additionality' stipulates that a project qualifying for CDM funding must lead to offsets that would not have otherwise happened. Since additionality is difficult to prove and can be subject to variable accounting methods, some have criticised the legitimacy of such criteria in determining the real added value of CDM projects.

18 Lazarus et al., 'Potential for international offsets to provide a net decrease of GHG emissions', op. cit.

19 Alexandre Kossoy and Pierre Guigon, *State and trends of the carbon market* (Washington, D.C.: World Bank, 2012), http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/State_and_Trends_2012_Web_Optimized_19035_Cvr&Txt_LR.pdf.

20 Olivier et al., 'Trends in global CO_2 emissions', op. cit.

21 United Nations Environment Programme (UNEP), *The emissions gap report 2012: A UNEP synthesis report* (Nairobi: UNEP, 2012).

22 This is the most ambitious emissions reduction target made by a developing country to date, although its achievability is questionable given the significant inconsistencies between Indonesia's carbon reduction pledge and the country's fossil fuel-intensive national energy development strategy. A prominent example is the Indonesian government's plan to install 35,000 megawatts (MW) of power capacity by 2020, the bulk of which will come from ongoing and new coal power projects. It is unrealistic to project that less carbon-intensive sources, such as renewable energy or even gas, will contribute significantly to that 35,000 MW of additional power.

23 DNA Indonesia and National Council on Climate Change (DNPI), 'Current status on carbon market in Indonesia' (PowerPoint presentation made during 'DNA Global Forum', 13–14 November 2014), 4.

24 Indonesia JCM Secretariat, 'Joint Crediting Mechanism development in Indonesia' (PowerPoint presentation, 2014), 14.

25 National Council on Climate Change (DNPI), 'Indonesia current carbon market challenge' (PowerPoint presentation made by Indonesia on 13 November 2013 during the 19th session of the Conference of the Parties [COP] to the UNFCCC [COP19], Warsaw, 11–22 November 2013).

26 Partnership for Market Readiness (PMR), 'Final market readiness proposal: Indonesia' (PowerPoint presentation), https://www.thepmr.org/system/files/documents/Indonesia%20MRP%20Final%20Presentation%20Marrakech.pdf, 61.

27 Personal communication, 3 February 2015.

28 DNA Indonesia and National Council on Climate Change (DNPI), 'Current status on carbon market in Indonesia', op. cit.

29 Ibid.

30 Indonesia JCM Secretariat, 'Joint Crediting Mechanism development in Indonesia', op. cit.

31 M. Lazarus, P. Erickson and R. Spalding-Fecher, 'Transitioning away from large-scale power projects: A simple and effective fix for the CDM?' (SEI Policy Brief, Somerville: Stockholm Environment Institute [SEI], 2012), http://www.sei-international.org/publications?pid=2204; Randall Spalding-Fecher et al., *Assessing the impact of the Clean Development Mechanism: Report commissioned by the high-level panel on the CDM policy dialogue* (Luxembourg: CDM Policy Dialogue, 2012), http://www.cdmpolicydialogue.org/research/1030_impact.pdf.

32 Miyaguchi and Shaw, 'CDM and its development impact', op. cit., 64.

33 Olivier et al., 'Trends in global CO_2 emissions', op. cit.

34 Ibid.

35 This was done primarily to reel in the oversupply of credits in the European Union's Emissions Trading Scheme and increase the value of the market.

36 Norway-Indonesia Partnership REDD+, 'Fact sheet Norway-Indonesia partnership REDD+', http://www.norway.or.id/PageFiles/404362/FactSheetIndonesiaForestMay252010.pdf.

37 National Council on Climate Change (DNPI), 'Press release: DNPI report set course for Indonesia's green growth', 6 September 2010, http://dnpi.go.id/DMS.V3/index.php?id=104; Catriona Moss, 'Peatland loss could emit 2,800 years' worth of carbon in an evolutionary eyeblink: Study', *Forests News*, 14 January 2015 (Center for International Forestry Research [CIFOR]), http://blog.cifor.org/26254/indonesia-peatland-forest-carbon-emissions-model#.VNGnCkfF_C8.

38 'Letter of intent between the Government of the Kingdom of Norway and the Government of the Republic of Indonesia on "Cooperation on reducing greenhouse gas emissions from deforestation and forest degradation"', signed 26 May 2010, https://www.regjeringen.no/globalassets/upload/smk/vedlegg/2010/indonesia_avtale.pdf.

39 Before establishment of the National Reducing Emissions from Deforestation and Forest Degradation Agency (BP REDD+) in 2013, REDD+ activities were overseen by the REDD+ Task Force.

40 'Jokowi folds emissions agency BP REDD+ into Forestry Ministry', *Jakarta Globe*, 29 January 2015, http://thejakartaglobe.beritasatu.com/news/jokowi-folds-emissions-agency-bp-redd-forestry-ministry/.

41 Hans Nicholas Jong, 'After only one year, REDD+ agency future is in doubt', *The Jakarta Post*, 10 January 2015, http://www.thejakartapost.com/news/2015/01/10/after-only-one-year-redd-agency-future-doubt.html.

42 As of January 2014, Japan has signed bilateral JCM agreements with 11 countries — Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Vietnam, Laos, Indonesia and Costa Rica in 2013, and Palau and Cambodia in 2014. See, Government of Japan, 'Recent development of the Joint Crediting Mechanism (JCM)', Joint Crediting Mechanism, January 2014, http://www.mmechnisms.org/document/20140122_JCM_goj.pdf.

43 United Nations Framework Convention on Climate Change (UNFCCC), 'Submission by Japan on the Framework of Various Approaches', 5 September 2013, 6.

44 United Nations Environment Programme [UNEP] Riso Centre, Progressing towards post-2012 carbon markets, Perspectives Series 2011 (Roskilde: UNEP Riso Centre, 2011), 17.

45 United Nations Framework Convention on Climate Change (UNFCCC), 'Submission by Japan on the Framework of Various Approaches', op. cit., 1.

46 Ibid., 2.

47 Interview with JCM Secretariat representative, Jakarta, 11 April 2014.

48 The JCM Promotion Scheme provides financing for up to half of the investment costs of an approved project in exchange for half of the issued credits to be delivered to the Government of Japan. See, Osamu Bannai, 'JCM financing programme and study programme' (PowerPoint presentation made during UNFCCC COP19 and the 9th session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol [CMP 9] side event, Warsaw, 12 November 2013), accessed 15 September 2015, http://www.mmechanisms.org/document/cop19_sideevents/unfccc/6_GEC.pdf.

49 Hanh Le and Anaïs Delbosc, 'Japan's bilateral offset crediting mechanism: A bilateral solution to a global issue' (Climate Brief No. 11: Focus on the Economics of Climate Change, Paris: CDC Climat, 2012).

50 Ibid.

51 Indonesia JCM Secretariat, 'Rules of implementation for the Joint Crediting Mechanism (JCM)', https://www.jcm.go.jp/rules_and_guidelines/id/file_01/JCM_ID_RoI_ver01.0.pdf.

52 Interview with JCM Secretariat representative, op. cit.

53 Dicky Edwin Hindarto, 'Nusantara Carbon Scheme (NCS): Indonesia first domestic emission reduction certification' (PowerPoint presentation, 2013), accessed 15 October 2014, http://www.iges.or.jp/en/archive/cdm/pdf/regional/20130306/4_Indonesia_Mr.Dicky.pdf, 7.

54 Private communication with former staff of National Council on Climate Change (DNPI), 4 February 2015.

55 Partnership for Market Readiness (PMR), 'Resolution No. PA 7/2013-1: Allocation of the PMR implementation phase funding for activities in Indonesia' (Seventh Meeting of the Partnership Assembly, Marrakesh, 22–23 October 2013).

56 Interview with DNPI representative, Jakarta, 7 April 2014.

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58 Interview with TGO representative, Bangkok, 22 April 2014.

59 Thailand Greenhouse Gas Management Organization (TGO), 'Status of CDM projects in Thailand' (2013), accessed 15 October 2014, http://www.tgo.or.th/english/index.php?option=com_content&view=category&id=32&Itemid=72.

60 Interview with TGO representative, op. cit.

61 Ibid.

62 Carbonmarket.tgo.or.th, as referenced during interview with TGO representative, op. cit. For a list of Thailand Carbon Offsetting Program (T-COP) participants, see Appendix 2.3.

63 Ibid.

64 Pongvipa Lohsomboon, 'Voluntary Emissions Trading Scheme (TVETS) and Voluntary Emission Reduction Program (T-VER) in Thailand' (presentation made at the Emissions Trading Seminar 'Emerging carbon markets in Asia and the way forward', Tokyo, 6 March 2013).

65 Interview with TGO representative, op. cit.

66 Ibid.

67 Ibid.

68 Partnership for Market Readiness (PMR), 'Draft market readiness proposal: Thailand' (PowerPoint presentation, 7 October 2013), accessed 15 October 2014, https://www.thepmr.org/system/files/documents/Thailand%20Draft%20MRP%20presentation%20%28PA7%29.pdf.

69 Interview with TGO representative, op. cit.

70 Benwell, 'Voluntary aspects of carbon emissions trading', op. cit.

71 Ibid.

72 Forest Carbon, 'WWF Vietnam — Feasibility study of a trans-boundary REDD+ conservation project in Laos and Vietnam', 8 October 2012, http://forest-carbon.org/project-list/wwf-and-forest-carbon-assess-the-feasibility-of-a-redd-trans-boundary-conservation-project-in-laos-and-vietnam/.

73 Ministry of the Environment of Japan (MOEJ), Budget document [In Japanese] (2011), http://www.env.go.jp/guide/budget/h24/h24juten-2.pdf; Ministry of Economy, Trade and Industry (METI), Budget document [In Japanese] (2011), http://www.meti.go.jp/main/yosangaisan/2012/doc03-2.pdf.

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75 Interview with JCM Secretariat representative, op. cit.; Interview, 27 April 2014.

76 Climate Funds Update, 'Norway's international climate and forest initiative', n.d., accessed 16 October 2014, http://www.climatefundsupdate.org/listing/norway-s-international-climate-and-forest-initiative.

77 Major industrial facilities that do not achieve emissions reduction targets of 12 per cent of the plant's average intensity must either contribute CAD 15 per tonne of greenhouse gas emission over the target to a green government fund (that invests in green technology) or purchase offset credits from other emitters who voluntarily reduce their emissions. See, Government of Alberta, Environment and Sustainable Resource Development, 'Alberta-based offset credit system', 19 September 2014, http://esrd.alberta.ca/focus/alberta-and-climate-change/regulating-greenhouse-gas-emissions/alberta-based-offset-credit-system/default.aspx.

78 India's Performance Achieve Trade (PAT) scheme is a market-based trading scheme that imposes mandatory energy consumption targets on targeted facilities whose energy reductions may generate energy savings certificates.

79 Since January 2008, Switzerland has imposed a carbon dioxide incentive tax on all hydrocarbon fuels, including coal, oil and natural gas, except when they are used in energy. This carbon tax is called an incentive tax because companies can choose to exempt themselves from it if they opt to participate in the cap-and-trade ETS instead.

Chapter Three

‘Source of Destruction’ or Target of a ‘Trade War’? Competing Narratives on the Palm Oil Industry in Indonesia

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This paper discusses how non-governmental organisations (NGOs) and palm oil companies in Indonesia are employing different narratives to shape state policies related to the palm oil industry. There are two conflicting narratives in the country’s palm oil industry-related policymaking process: (i) the ‘source of destruction’ narrative constructed by the NGOs; and, (ii) the ‘trade war’ narrative propounded by Indonesian palm oil companies and their associations. The source of destruction narrative calls for more control of the business practices of palm oil companies, including halting the expansion of palm oil plantations to stop deforestation, while the trade war narrative portrays this demand for more government control of their business practices as an instrument of trade war that is being used by developed countries to protect the competitiveness of their vegetable oils in the global market. Both narratives have shaped the Indonesian government’s policies on palm oil. The source of destruction narrative influenced discussions on the Law on Prevention and Eradication of Forest Destruction and successfully pushed the government to enact a moratorium on forest conversion. The trade war narrative has also successfully blocked important demands from NGOs, such as their call for a review of existing concession permits within the mechanism of the moratorium. The trade war narrative also led to the establishment of inter-ministerial coordination for organised counter-campaigns against the anti-palm oil campaigns of NGOs. It even prevailed on the government to include palm oil as an agenda item in Indonesia’s economic diplomacy. However, the influences of the two competing narratives have given rise to ineffective and divergent government policies with conflicting aims and goals. To build an effective policy related to

the palm oil industry, policy actors, especially the government, would need to build a consolidated narrative that can bridge both these narratives. Such a metanarrative is not impossible.

Keywords: Environment, Indonesia, narrative, palm oil, trade war

Biography

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2. Makmur Keliat et al., *Liberalisasi Jasa ASEAN dan Tenaga Kerja Terampil Indonesia* (Yogyakarta: Insist Press, 2014).
3. *ASEAN di Persimpangan Sejarah* [ASEAN at the crossroads] (Jakarta: Obor, 2015).

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"One element of our diplomacy, my personal struggle, is to ensure that there is no barrier against Indonesian products abroad."
President Susilo Bambang Yudhoyono, 18 September 2014[1]

1. Introduction

Palm oil has become the most important agricultural industry in Indonesia. While in 1980, there were only two provinces with palm oil plantations, by 2014, these had spread across 23 provinces[2], occupying 10.9 million hectares (ha) of land (compared to 0.28 ha in 1979[3]) and producing 29.3 million tonnes (mt) of crude palm oil (CPO).[4] Palm oil's lower production cost and high yield compared to other seed-based oils make it very competitive in the global market.[5] Rising demands from China and India have driven the development of the palm oil industry further, and currently Indonesia and Malaysia supply around 90 per cent of CPO in the global market.[6] Oil palm is now Indonesia's leading plantation crop, surpassing coconut (approximately 3.6 million ha of land), rubber (nearly 3.5 million ha of land) and cocoa (roughly 1.7 million ha of land).[7]

Environmental non-governmental organisations (NGOs), such as Greenpeace and WALHI (*Wahana Lingkungan Hidup Indonesia*; or, Indonesian Forum for Environment), have serious concerns about the rapid development of the palm oil industry in Indonesia. Greenpeace argued, for instance, that the palm oil sector was the single largest driver of deforestation in Indonesia during 2009–2011.[8] Other NGOs, such as Sawit Watch, have also raised concerns about the social impacts of the expansion of the palm oil industry.[9]

As the industry continues to grow, global and local NGOs have been increasingly pressurising the Indonesian government to prevent further environmental and social destruction allegedly linked to the expansion of its palm oil industry. In response to such pressure, the government placed a moratorium on forest conversion in 2011 that was later extended until 2015.

On the flip side, palm oil companies have responded to such criticism from NGOs by claiming that censure from these organisations, and the NGOs themselves, is part of a global scheme orchestrated by less competitive vegetable oil producer countries to disrupt the competitiveness of palm oil in the global market. According to these companies, it is in 'the most vital national interest' that the industry be protected.[10] They also insist that palm oil and associated business activities are environmentally friendly, especially when compared to other vegetable oils available in the market.[11] They suggest that the campaign against palm oil is not about the environment, but a 'trade war' being waged by developed countries against Indonesia.[12]

This chapter discusses how NGOs and palm oil companies have used different and competing narratives — identified herein as the 'source of destruction' and 'trade war' narratives — to shape state policies and the policy debate related to the palm oil industry in Indonesia. To explore how and why these duelling narratives were constructed as well as the nature of their impacts, this article relies on in-depth interviews with relevant actors, observations of events organised by these actors, and primary documents collected from various sources, including from the government, palm oil companies, NGOs and the media.

1.1 Why is it important to study narratives?

Narratives are central to policymaking processes. To understand any policymaking process, one needs to understand the narratives being used by the various actors involved. This understanding is based on the assumption that language is not a mere reflection of reality; it constructs what reality is.[13] Hence, policy debate is not only an interaction between arguments or facts, but a battle between discursive frameworks or stories.[14]

Jacobs and Sobieraj argue that actors 'draw on specific narratives in order to connect their policy proposal, public needs, and their own needs for legitimacy'.[15] Narratives are useful to stabilise assumptions, which are necessary to construct a particular policy.[16] In the case of the palm oil industry in Indonesia, the actors employ different narratives with opposing characterisations, metaphors and plots, aiming to influence state policies and nullify the impact of the opposing camp.

Many scholars have employed the narrative analysis to understand policy debates on various issues. For example, Jacobs and Sobieraj used narrative analysis to understand the US Congress debate on the non-profit sector[17] while Bedsworth, Lowenthal and Kastenberg applied it on the California low-level radioactive waste debate[18], and Bridgman and Barry employed the analysis when discussing the regulatory debate in New Zealand[19].

In Indonesia's context, Bissonnette has elaborated the 'representations' of the palm oil industry in the government's narrative, which though does not reflect problems on the ground.[20] The present effort begins by following the frameworks of these earlier works.

First, this paper assesses consistency between the key actors' stories and publicised accounts of their action (as outlined by Bridgman and Barry[21]) and identifies the frame in which the narratives were developed. This is important, as actors often select information and organise it to develop a particular narrative. Next, the relationships between actors according to each narrative are identified. The article also elaborates the plots of the narratives and how they have been employed to direct or reject a particular policy. Such policy agenda is embedded in the plot of the narrative, ending with particular calls for action.

Finally, after identifying the narratives and associated policy agendas, this paper assesses their impacts on the policymaking process. To do so, it examines government policies to pinpoint particular narratives that may have either influenced or been adopted as background for such policies.

2. Methods

This paper used in-depth interviews, focus group discussions (FGDs), observations and data collected from relevant sources.

In-depth interviews and FGDs were conducted in an open-ended manner so that participants — such as NGO activists, representatives of palm oil companies (including the General Secretary and Head of the Division of Advocacy of the Indonesian Palm Oil Association, or *Gabungan Pengusaha Kelapa Sawit Indonesia* [GAPKI]) and palm oil growers (Secretary General of the Indonesian Palm Oil Growers Association, or *Asosiasi Petani Kelapa Sawit Indonesia* [APKASINDO]), and Indonesian government officials — could narrate their stories. A workshop organised by a newspaper, Radar Malang, on 19 June 2014 was observed[22], as it was sponsored by GAPKI.

Data was collected from various relevant sources, such as:

- Newspaper articles concerning the palm oil industry in Indonesia during 2009–2014.
- Minutes of meetings in Indonesia's House of Representatives (Indonesian People's Representative Council, or *Dewan Perwakilan Rakyat* [DPR]) regarding the legislation of the Law on Prevention and Eradication of Forest Destruction (*Undang-Undang Pencegahan dan Pemberantasan Perusakan Hutan*) and the Law on Mass Organizations (*Undang-Undang Organisasi Masyarakat [Ormas]*).
- Statements, in-house publications, press releases and position papers from NGOs, palm oil companies and their association (GAPKI), palm oil growers' association (APKASINDO), and related government agencies (such as Ministry of Agriculture, Ministry of Trade, Ministry of Foreign Affairs, and the Presidential Delivery Unit for Development Monitoring and Supervision, or UKP4[23]).

3. History of the Palm Oil Industry in Indonesia

A native of West Africa, oil palm (*Elaeis guineensis*) grows in the humid tropics.[24] The first oil palms in Indonesia (then known as the Dutch East

Indies) were four specimens planted at the Bogor Botanical Gardens (*Kebun Raya Bogor*) in Bogor (or, *Buitenzorg* in Dutch) in 1848. The species gained favour as an 'ornamental houseplant' in the Deli tobacco plantations[25] and, by the mid-nineteenth century, was being cultivated and used for industrial purposes in Central Java[26]. The Agrarian Law of 1870, issued by the Dutch Colonial Administration, provided the legal basis for the opening of the first commercial oil palm plantation in 1911[27] following a successful trial of oil palm cultivation in 1875[28].

The first palm oil factory in Indonesia was built in 1919, with exports of CPO touching 576 tonnes for the year. By 1919, more than 6,000 ha of land had been planted with oil palm in Sumatera. These numbers rose to 32,000 ha in 1925, 64,000 ha in 1930 and over 90,000 ha in 1938.[29] In 1937, the Dutch East Indies was the largest exporter of CPO, with 40 per cent share of total global CPO exports.[30] Following World War II, in the aftermath of Japanese colonialism and the complex situations of the early post-Independence period, Indonesia's CPO production fell from 239,000 tonnes in 1940 (as Dutch East Indies) to 147,000 tonnes in 1958, with its market share dropping to 17 per cent, or to levels below both Nigeria and Congo.[31]

The revival of palm oil production as a major agricultural industry in Indonesia took place with the state's help following the rise of the New Order in 1965–1966. In the early stages, the state was directly involved in the development of the industry through *Perseroan Terbatas Perkebunan* (PTP).[32] As the palm oil industry re-emerged as an important segment of Indonesia's economy, the area devoted to oil palm cultivation on government estates rose from 84,000 ha in 1969 to 176,000 ha in 1979 and 343,000 ha in 1987.[33]

Gradually, the state reduced its involvement with the deregulation of policies in Indonesia during the late 1980s, with the government inviting more involvement from the private sector through the PIR (*Perkebunan Inti Rakyat*; or, People's Nucleus Estate) scheme.[34] In 1994, the government further liberalised the sector by initiating a programme of cooperative investment.[35] As liberalisation helped the industry grow, the

total plantation area, including state and private estates, rose significantly from 117,000 ha in 1969 to 3.9 million ha in 1999.[36] CPO production also increased from 188,000 tonnes in 1969 to 6.4 mt in 1999.[37]

The fall of President Suharto in 1998 gave way to institutional arrangements that were conducive to the further growth of the palm oil industry.[38] Following Indonesia's commitment to the structural reforms outlined by International Monetary Fund (IMF)[39], the government eased restrictions for foreign investment in the palm oil sector and foreign companies, mainly from Malaysia and Singapore, such as Sime Darby and Wilmar, started to expand their plantations in Indonesia.

On the regulatory aspect, the post-Suharto reforms, driven by a desire for greater political freedom and decentralisation, have led to greater autonomy for local governments. In 1999, the Government issued Law No. 22/1999 on Regional Governments, effectively transferring many authorities previously held by the central government to local governments, including the authority to issue plantation permits for oil palm plantations.[40] This led to a rise in the number of plantation permits, especially in the Sumatera and Kalimantan provinces.

Global developments also played important roles, with the demand for palm oil increasing with the rise of China and India.[41] Thus, a combination of global (rising demands from the global market) and domestic (economic liberalisation and decentralisation policy) factors has boosted the expansion of the palm oil industry in Indonesia. Not surprisingly, in 2006, Indonesia surpassed Malaysia as the world's largest CPO producer and, in 2010, CPO from Indonesia composed nearly half (48 per cent) of the global CPO market.[42]

4. NGOs and their Narrative: Palm Oil as Source of Destruction

The expansion of palm oil plantations and its impacts on Indonesia's forests have attracted widespread responses from environmental NGOs. The chapter mainly focuses on Greenpeace and its narrative, as it is one

of the most vocal and influential actors shaping government policies on the palm oil industry in Indonesia.[43]

By 2003, Greenpeace was already active in Indonesia, focusing on the impacts of the pulp and paper industry. Since the latter half of the 2000s, the NGO has increasingly redirected its attention on palm oil.[44] Other NGOs and think tanks began paying attention to the palm oil industry at around the same time, too. The World Resource Institute (WRI), for instance, began its Project POTICO (Palm Oil, Timber, Carbon Offsets) in Indonesia in 2009.[45]

In November 2007, Greenpeace released a report, titled 'How the palm oil industry is cooking the planet'. This report argued that Indonesia's palm oil industry was an important factor behind the destruction of Indonesia's forests, with 1.8 billion tonnes of climate-changing greenhouse gas (GHG) emissions being released every year by the degradation and burning of Indonesia's peatlands.[46] The report also accused global companies, such as Unilever, Nestlé and Procter & Gamble (P&G), as large users of palm oil from Indonesia, of being complicit with this forest destruction.[47]

The publication was followed by a more focused campaign against major brands that used palm oil. In April 2008, Greenpeace published a report accusing the suppliers of Unilever of 'burning up Borneo'.[48] It evaluated the environmental impacts of major Unilever palm oil suppliers, including Sinar Mas, IOI, ADM-Kuok-Wilmar, Sime Darby, Musim Mas, Astra Agro and Asian Agri, and concluded that these companies were 'laying claim to large tracts of forest and peat land, with devastating impacts on climate and biodiversity'.[49] The report asked the company to 'clean up the trade' by stopping trade with those engaged in forest destruction and called on the Government of Indonesia to establish a moratorium on forest clearance and peatland degradation.[50]

The campaign against Unilever was successful, with the company declaring its commitment to clean up the supply chain in May 2008.[51]

Furthermore, in December 2009, Unilever dropped contracts worth USD 30 million with Golden Agri Resources Limited (GAR)[52], the palm oil arm of Sinar Mas, which is the largest oil palm plantation group in Indonesia and the second largest in the world.[53] In March 2010, Kraft, another major global brand, declared its commitment to 'no purchase' from GAR. In September 2010, Burger King also dropped their contracts with the Indonesian company.[54]

In 2010, Greenpeace launched their campaign to target another major user of palm oil, Nestlé. The report, titled 'Caught red handed: How Nestlé's use of palm oil is having a devastating impact on rainforest, the climate, and orang-utans', was published in March 2010.[55] In this report, Greenpeace put Sinar Mas in the spotlight again — as an important supplier of Nestlé, Sinar Mas was allegedly involved in various destructive business practices in Indonesia's forests. With beautifully taken pictures, the publication showed Sinar Mas' 'crimes'[56] — from the burning of tropical forests to threatening people's livelihood and driving out the orang-utans.

Other NGOs too have raised concerns about the negative social impacts of the expansion of the palm oil industry. Sawit Watch frequently protests against palm oil companies for their exploitation and bad treatment of plantation workers. It also blamed the companies for the emergence of land conflicts in Indonesia, victimising workers and farmers, and frequently leading to human rights abuses.[57] According to them, contrary to the representation of the expansion of oil palm plantations by the government and plantation companies as a panacea for Indonesia's development problems, many problems — economic and social — exist on the ground and, instead of being a force for good, palm oil had become the source of destruction.

However, representatives from the palm oil industry dismissed Greenpeace's allegations as insinuative and baseless. For instance, Tungkot Sipayung's response was that '… [a] previously selected picture of a small part of a particular plantation could not be used as an indicator of the situation of the whole palm oil industry'.[58] They argued that the

destruction shown by Greenpeace was a minor anomaly and thus could not be used to judge Indonesia's palm oil industry.

These developments, nevertheless, hit Sinar Mas hard and rang alarm bells for other palm oil companies. Greenpeace pressed Sinar Mas further by organising various direct campaigns against its business practices in the palm oil sector. On 19 March 2009, Greenpeace activists put a giant banner at Sinar Mas' headquarters in Jakarta declaring 'Sinar Mas — "Forest and climate criminal"'.[59]

The initial response by Indonesia's palm oil companies was confrontation. In 2009, many in these companies continued to believe that such campaigns by NGOs would not affect their business, as global demand was still very promising.[60] Despite this, they responded negatively to the campaigns, especially those by Greenpeace, referring to them as black campaigns that needed to be 'critically assessed'[61] and 'confronted'[62]. Many NGO activists, including those from Greenpeace and Sawit Watch, believed that Sinar Mas was behind a series of demonstrations against Greenpeace that were staged by local ethnic-based mass organisations, such as FORKABI (*Forum Komunikasi Anak Betawi*; or, Communication Forum for Betawi People) and FBR (*Forum Betawi Rempug*; or, Forum for United Betawi), in 2009 and 2010.[63]

In spite of the early opposition, Sinar Mas (or, GAR and its subsidiary, SMART) finally backed off and, in February 2011, GAR declared its commitment to a 'Forest conservation plan'. Working with the Forest Trust and Greenpeace, in June 2012, GAR published the 'High carbon stock forest study report' to identify forests for conservation and implement its commitment.[64] However, the changed stance of Sinar Mas did not reflect the stance of Indonesia's palm oil companies in general.

A bigger success was achieved in 2011 when President Susilo Bambang Yudhoyono issued Presidential Instruction No. 10/2011, creating a moratorium on forest conversions.[65] However, NGO activists viewed this development cautiously, as it did not completely satisfy NGO demands to review existing plantation permits. According to NGO activists, other

hindrances, such as bad governance and overlapping area maps drawn by different government institutions, also made the moratorium ineffective for stopping forest destruction.[66] Thus, although an extension of the moratorium was issued through Presidential Instruction No. 6/2013 (extending the moratorium until 2015), many NGOs have continued to keep up the pressure on the government to implement an effective moratorium by addressing governance problems and reviewing existing plantation permits.[67]

On a closer look, various campaigns by prominent NGOs, such as Greenpeace and Sawit Watch, can be seen as connected by a single narrative. While the reports have focused on various different actors, including governments and specific companies, the narrated story is similar, with parallel actors, roles and plots. This article defines the narrative adopted by these NGOs as the source of destruction narrative.

4.1 Actors and their relationships

The reports frequently describe the actors and their relationships in the source of destruction narrative quite clearly. Its central storyline is the struggle between the palm oil industry (labelled as 'the perpetrator'[68]), and the environment and the people affected (portrayed as the 'victims'[69]). The companies are described as profit seekers neglecting the social and environmental impacts of their business practices.

However, it is important to note here that, while the narrative describes palm oil companies as a source of destruction, Greenpeace and other NGOs have declared that they are not 'anti-palm oil'[70]; their demand is merely for responsible business practices. The reports argue that environmental destruction can only be tackled with cooperation from governments and companies. Thus, despite criticism from certain NGOs, Greenpeace has been working closely with GAR (post 2011) to develop better business practices, while being cautious against 'green washing'[71] by the company.

In this context, Greenpeace portrays itself as an independent actor helping the people to protect the environment and protecting the people from the environmental and social destruction being caused by the palm oil industry. In response to many attacks from palm oil companies, Greenpeace has frequently stressed that their organisation does not receive any donations from any company or government.

In this narrative, the portrayal of the government is mixed. The government agency with relatively positive evaluations in the eyes of Greenpeace and other NGOs is UKP4. The government is often portrayed as ineffective due to overlapping authorities, and various agencies and institutions have the authority to take decisions regarding the use of land in a particular area. For example, the Ministry of Forestry has the authority to decide which area should be included as conservation forest (*hutan konservasi*), protected forest (*hutan lindung*) and production forest (*hutan produksi*) while the municipalities and provinces have the authority to issue plantation permits. As a consequence, maps from the Ministry of Forestry and those on plantation permits often do not match. In an interview, a Greenpeace activist noted that the government does not have even a single spatial map while referring to overlapping maps from different central and local authorities.[72]

Contrary to the narrative of the palm oil industry, which puts the dynamics between developed and developing countries at the centre of the story, developed countries as a single actor are not elaborated upon in the Greenpeace narrative. However, in order to reject allegations levelled by palm oil companies that NGOs are but pawns deployed by developed countries in their trade war against palm oil, activists have frequently distanced themselves from such associations by pointing out Greenpeace's activities against environmental destruction in developed countries in different instances.

In the Greenpeace narrative, on the one hand, major brands from developed countries, such as Unilever, Nestle and P&G, are criticised

for being 'partners in crime'.[73] On the other hand, it is also suggested that these companies could act as demand disruptors, wherein they could put an end to the crimes perpetrated by palm oil companies by cleaning up their supply chain or by stopping contracts with palm oil companies involved in various forms of environmental destruction.

In response to the 'national interest' narrative adopted by palm oil companies, Greenpeace activists point out that the benefits of palm oil expansion do not trickle down.[74] Foreign palm oil companies are major players in Indonesia's palm oil industry and many of them are not practising responsible business practices. Thus, according to Greenpeace, invoking the nationalist sentiment to delegitimise the criticism of palm oil companies by NGOs is mere manipulation. By constructing their narrative in this manner, NGOs are calling on the government to not support the expansion of palm oil plantations under the false rhetoric of nationalism.

A video campaign launched in February 2014 sums up the plot of the narrative neatly.[75] The recording begins by describing how palm oil is present in various products in our daily lives, thus raising its demand. However, the palm oil industry has a 'dirty secret'[76] — as Indonesia's palm oil industry has grown due to rising demands for CPO in the 2000s, it has expanded plantations rapidly, causing widespread environmental destruction and various other negative social impacts.

According to this narrative, efforts to halt further destruction have been partly successful, although not adequate. Corrupt practices by companies and government officials make it difficult to push for real reform. The narrative concludes with a call for action to push for more reforms in the sector, such as by reviewing existing plantation permits of palm oil companies.

5. Palm Oil Strikes Back: The Narrative of Trade War

When campaigns by NGOs started to intensify in the mid-2000s, the palm oil industry's initial response was mixed. While there was confidence

that these campaigns would not hurt the growing demand for palm oil[77], there were also worried voices, especially following the proposal by the European Union (EU) to establish the Renewable Energy Directive in the EU.[78] When the Directive was established in 2009 (officially titled as 2009/28/EC)[79], response from the palm oil industry was negative although not well organised. According to the Director of the Directorate of American and European Intra-Regional Cooperation (*Direktur Kerja Sama Intrakawasan Amerika-Eropa*) at the Indonesian Ministry of Foreign Affairs, when the Ministry notified Indonesian palm oil companies of the EU Renewable Energy Directive and its possible impacts on the industry, the industry was already aware of the developments but did not see them as a real threat.[80]

Palm oil companies only started to organise their responses against NGO campaigns when major brands, such as Unilever and Kraft, began dropping their contracts. Since 2009, GAPKI and APKASINDO have organised seminars and workshops across the archipelago to correct public perceptions on Indonesia's palm oil industry.[81] During January–June 2014 alone, four major workshops had been completed in different cities in Kalimantan and Java.[82] During the workshops, NGOs that have been identified as anti-palm oil NGOs are denounced for promoting the agenda of developed countries with a view to protecting their own competitiveness in the vegetable oil market. These workshops usually have journalists and students as invitees. As a follow-up to the workshops, GAPKI has sought to maintain good relationships with these journalists in order to project their narrative to a wider audience.

In addition to defensive measures to clarify allegations against the palm oil industry, palm oil companies have gone on the offensive, too. For instance, during heightened tensions between GAR/Sinar Mas and Greenpeace in 2009–2010, some groups demonstrated against Greenpeace for being the mouthpiece of foreign interests and for threatening national interest. Many activists believe that palm oil companies set up these demonstrations[83] although the companies themselves reject such claims[84].

Another important move by Indonesian palm oil companies was the decision by GAPKI to end its membership of the Roundtable on Sustainable Palm Oil (RSPO) on 29 September 2011. GAPKI left RSPO and collaborated with the Ministry of Agriculture to strengthen the Indonesian version of RSPO, the Indonesian Sustainable Palm Oil System (ISPO).[85]

This paper defines the narrative adopted by palm oil companies in response to criticism by NGOs by connecting all their moves within the trade war narrative. This narrative begins with the story of the growth of palm oil in the global market. In the early 2000s, soybean oil dominated the world's vegetable oil market, with a 35.64 per cent share, while palm oil was second, with 30.54 per cent share. Rapeseed and sunflower were at the third and fourth places, with 20.20 per cent and 13.62 per cent market shares, respectively.[86] In 2008, palm oil — with over half of the supply coming from Indonesia — led the global vegetable oil market, with a 41.47 per cent market share.[87] By then, soybean oil's market share had declined to 32.03 per cent.[88] However, the commodity that was the most affected by the rising demand for palm oil was sunflower oil, a commodity being produced in the EU countries. Sunflower oil's market share dwindled from 18.14 per cent in 1990 to 9.4 per cent in 2008.[89] In the trade war narrative embraced by the palm oil companies, these facts served as background for the campaigns initiated by many NGOs, including Greenpeace, against palm oil and for the policies adopted by the developed countries, be it the Renewable Energy Directive in the EU in 2009 or the decision by the US Environmental Protection Agency (EPA) in 2012 to exclude palm oil from its biodiesel programme.

According to the trade war narrative, palm oil needs less land to produce more oil and is thus significantly friendlier to the environment.[90] In this narrative, 'all of these happen because of trade war, because oil palm is more efficient compared to other vegetable oils'.[91] According to these companies, the war started even before palm oil surpassed soybean oil in the vegetable oil market in the mid-2000s due to rumour-mongering that palm oil was dangerous to human health.[92] This argument

is not unfounded. In 1986, the American Soybean Association (ASA) launched an intensive media campaign devised to brand palm oil as dangerous for health. ASA put full-page advertisements that labelled palm oil as 'an unhealthy tropical grease' and requested the US Food and Drug Administration (FDA) to impose compulsory warning labels on all products containing 'tropical oils' (including palm oil, of course).[93] ASA even went as far as trying to confuse the public by associating palm oil with the highly saturated palm kernel oil.[94]

The reasoning behind GAPKI's move to cancel its RSPO membership is consistent with the narrative of a trade war between developed and developing countries. According to Asmar Arsjad, Secretary General of APKASINDO, and Tungkot Sipayung from GAPKI, RSPO is dominated by developed countries that have no intention of helping developing countries.[95] When the Malaysian Palm Oil Association (MPOA) voiced their plans to quit RSPO, GAPKI and APKASINDO lauded the move and declared that RSPO was no longer credible. Again, the move was placed within the frame of a trade war. Dato' Dr Makhdzir Mardan from the MPOA noted that Malaysia must develop its own standards to be free of its dependence on Europe and the US.[96]

If the central storyline of the source of destruction narrative is the fight between palm oil companies and the environment and the people, the main plot of the trade war narrative is the fight between developed and developing countries. Two narrative threads in the latter are particularly illuminating:

(i) '[t]he government must realise that this is not an issue of environment. Behind this (black campaign) are big interests of less competitive vegetable oil producing countries'[97]; and,

(ii) '[t]he black campaign by Greenpeace will hurt the state and farmers and therefore the government should be cautious of the foreign NGO ... Europe and the US are not producers of crude palm oil, so this is a trade war. The price of their vegetable oil cannot compete with our CPO price, we need to understand this.'[98]

A consolidated version of this narrative maybe found in the white paper published by GAPKI in 2013, titled 'Indonesia and oil palm plantations amid global environmental issues'.[99]

In the trade war narrative, palm oil is portrayed as an important national interest. Presentations by GAPKI and media statements by palm oil industry representatives consistently propound the contributions of the palm oil industry to Indonesia's economy, including to rural development and poverty alleviation. They also present statistical correlations between palm oil expansion in a particular province and the reduction of poverty in the region.[100] The narrative stresses that over 21 million Indonesians make their living through the Indonesian palm oil industry.[101] GAPKI has consistently attempted to incorporate APKASINDO, the association of smallholders, in constructing the trade war narrative. For instance, GAPKI has invited the leaders of APKASINDO to speak at events sponsored by it. In doing so, GAPKI has tried to portray that palm oil is the interest of the people (not only the companies), and especially in the interests of farmers in rural areas.

The narrative goes on to argue that this national interest is now under attack, mainly because developed countries are not happy with the growing share of palm oil in the global market at the expense of their own products, such as soybean, rapeseed and sunflower. Using their power and money, developed countries have launched campaigns against palm oil in order to protect the competitiveness of their own vegetable oils. They finance and spread the black campaign against the Indonesian palm oil industry, even by making donations to NGOs that are critical of palm oil.

In this context, NGOs have been portrayed as agents of developed countries, consciously or not, blocking the development of the palm oil industry and, at the same time, benefitting other vegetable oil producers. While objectives and intentions of NGOs might be noble, they were being used by developed countries to halt the development of palm oil in Indonesia by getting them to focus their attention on the palm oil industry and its impacts on the environment.[102]

According to the trade war narrative, most government agencies are 'pawns of foreign power' (*antek-antek asing*)[103], too. GAPKI and APKASINDO often argue that UKP4, the agency responsible for the enactment of the forest conversion moratorium passed during President Yudhoyono's tenure, was an example of how foreign powers and NGOs could control the government.[104]

During the journalist and student workshop in Malang, East Java, on 19 June 2014 (Figure 3.1), the speakers opened the event with a story about how developed nations colonised Asia and Africa, and continue to try to control them. It concluded with a statement that, as Indonesia's palm oil industry continues to grow and threaten their own competitiveness in the global markets, developed countries are trying to destroy it.

Figure 3.1: Workshop for journalists and students on 'Correcting the negative perceptions on Indonesia's palm oil industry'.

Credit: Author.

Note: The use of nationalist attributes (e.g., the national hat or '*peci*', with red and white pins, and the moderator's costume similar to the uniform of Indonesia's revolutionaries) and nationalist slogans during the event was not a coincidence.

The narrative ends with a call for action from the government — as this was a trade war being waged by developed countries, the Indonesian

government needed to step in and fight for its national interests by making palm oil an integral part of Indonesia's economic diplomacy agenda.[105]

6. Assessing Impacts on the Policymaking Process

This chapter argues that contrasting narratives are being employed by different actors to shape policymaking related to the palm oil industry in Indonesia (Table 3.1). While the NGOs frame their arguments in terms of environmental and people-centric issues, palm oil companies frame the issue within the context of relations between developed and developing countries in the global markets. Both parties are rooting for different policy agendas, and it remains to be seen as to which one of them is having a greater impact on the Indonesian policymaking process.

Table 3.1: Frame, actors and call for action by the source of destruction and trade war narratives.

Variable	Narrative 1 (Source of destruction)	Narrative 2 (Trade war)
Frame	Palm oil industry as the source of destruction	Indonesia's palm oil industry as a victim of trade war by developed countries
Actor		
Central character opposition	Palm oil company versus the environment and people	Developed countries versus developing countries
Non-governmental organisations	Saviour	Agents of developed countries
Palm oil companies	Source of destruction (if they only seek profit), but could be a force of good (if they act responsibly)	Driver of economic growth; palm oil as 'national interest'
Government	Mixed (UKP4 assessed relatively more positively)	Mixed (UKP4 as an example of foreign control over the government)
Developed countries	Not elaborated upon	Antagonists
Call for action	Halt the expansion of oil palm plantations; create better governance	Protect palm oil industry and support its expansion; make palm oil a priority in Indonesia's economic diplomacy

UKP4 = Presidential Delivery Unit for Development Monitoring and Supervision

The chapter, while exploring the primary approaches adopted by the two opposing narratives: (i) identifies actors in the government that support and embrace a particular narrative; and, (ii) looks at several policies related to the palm oil industry to determine the dominant narrative behind government policies.

6.1 Support for narratives

The government agency that embraces the source of destruction narrative is UKP4. It was through close coordination with this government agency that NGOs successfully pushed for the moratorium on forest conversion.[106] One reason for this is possibly that many UKP4 officials are previously known professionals and NGO activists, who are thus more reachable for these NGOs.[107] Representatives from the palm oil industry, while avoiding making public statements on the issue, have frequently expressed their disappointment with UKP4, dubbing the organisation as 'a foreign NGO in the government office'.[108]

In contrast, government agencies that have embraced the trade war narrative include the Ministry of Foreign Affairs, Ministry of Trade and Ministry of Agriculture. The Ministry of Agriculture is working closely with the palm oil industry to develop ISPO. It also uses the term 'black campaign' frequently while addressing criticisms against the Indonesian palm oil industry.[109] The Ministry of Foreign Affairs and the Ministry of Trade are collaborating with the palm oil industry to place palm oil prominently within Indonesia's economic diplomacy agenda. High-ranking officials, including the Minister of Trade and the Vice Minister of Trade, often make statements that echo the trade war narrative employed by the palm oil companies. For instance, the Vice Minister of Trade once noted that the campaign against palm oil was connected with the fact that other vegetable oil producers, such as those of rapeseed, sunflower and soybean, were not happy because they could not compete with palm oil.[110] He also said, 'Greenpeace never looks at the positive aspects of palm oil industry'.[111]

6.2 Policy results

The source of destruction narrative influenced the discussion on the Law on Prevention and Eradication of Forest Destruction and the moratorium on forest conversion in 2011.

The Law on Prevention and Eradication of Forest Destruction was originally discussed as the Law on the Prevention and the Elimination of Illegal Logging (*Undang Undang Pencegahan dan Pemberantasan Pembalakan Liar*). The draft of the law was proposed in 2002 and placed as a priority in the legislating agenda of the House of Representatives (*Prolegnas DPR*) in 2010.[112] However, during a public hearing session on the original legislation, NGOs (such as World Wildlife Fund [WWF], Greenpeace, Telapak and WALHI) voiced their complaints about the draft. Greenpeace argued that the draft was too small in scope (limited to illegal logging, with the danger of criminalisation of local communities) and thus omitted larger crimes, such as illegal deforestation for the expansion of palm oil plantations.[113] Later, lawmakers agreed to change the title into the Law on Prevention and Eradication of Forest Destruction.[114] Many NGOs, however, were not impressed with this change in the legislation's title.[115]

While the moratorium on forest conversion in 2011 and its extension until 2015 are arguably significant achievements from the perspective of the source of destruction narrative, the trade war narrative was also successful in halting important demands from NGOs, such as reviews of existing concession permits. NGO activists also complained that the moratorium was rendered ineffective due to poor enforcement and argued that the government was not being honest on its commitment to stop deforestation. The trade war narrative has contributed to the establishment of inter-ministerial coordination for organising counter-campaigns against the anti-palm oil campaigns and the inclusion of palm oil as an agenda in Indonesia's economic diplomacy as well.

Since the early 2010s, the Indonesian Ministry of Trade has occasionally brought Indonesian delegations to Europe to meet with various stakeholders related to palm oil. The latest delegation to visit Europe was in March 2014 to meet with the European private sector, press and representatives of the European Parliament. The Ministry of Foreign Affairs and the Ministry of Trade positioned palm oil in their diplomatic agenda at the Asia-Pacific Economic Cooperation (APEC) Summit in Vladivostok, Russia, in 2012 and suggested that palm oil be put in the Environmental Goods list.[116]

7. Concluding Remarks: Building Consolidated Policies

The influences of the two competing narratives engaged by the NGOs and palm oil companies are evident in the positions taken up by various Indonesian government agencies, and these have created ambiguity in the government's position vis-à-vis the palm oil industry. This has, in turn, led to ineffective policies related to the industry, as various government policies have as basis dissimilar narratives that aim for contradicting goals.

At the end of President Yudhoyono's term, ambiguity in the government's position remained. President Yudhoyono publicly mentioned that he was expecting the next President to continue the moratorium on forest conversion despite frequent demands by the palm oil industry to cancel it.[117] At the same time, Yudhoyono echoed the trade war narrative too, noting that the Indonesian palm oil industry was often treated unfairly by developed countries under environmental pretexts. In a press conference before his last presidential trip to New York, referring specifically to palm oil, President Yudhoyono pledged to 'ensure that there is no barrier against Indonesian products abroad'.[118]

His successor, President Joko Widodo, pledged to continue the effort. When President Widodo met US President Barack Obama and Herman Van Rompuy, President of the European Council, in November 2014, he demanded that they lift restrictions on palm oil imports.[119] Interestingly, President Widodo decided to dissolve the UKP4 and transferred its functions to the Presidential Office.

To build an effective policy vis-à-vis the palm oil industry (instead of divergent policies with contradicting aims), policy actors, and especially the Indonesian government, need to build a consolidated narrative that can bridge the source of destruction and trade war narratives. Such an all-encompassing narrative, or metanarrative, is not impossible, as is evident from the cooperation between GAR and Greenpeace post 2011. Recognising the concerns of both narratives and policy actors, and subsequently looking for common elements among the

competing narratives would be necessary steps to consolidate such divergent policies.

The consolidation of this metanarrative must proceed hand in hand with institutional and policy reforms. An important first step would be centralising palm oil-related policies to a single government agency or an interagency task force. This will help to ensure that government agencies share similar visions on the issue of palm oil and also harmonise the overlapping authorities currently present in relation to the development of the palm oil industry among the various levels of government in Indonesia.

An important aspect of the proposed harmonisation is the establishment of a single map that can serve as the basis for any decision-making. Currently, although each ministry produces its own maps, these have not been harmonised with each other or with maps at different levels of jurisdiction.[120] Combining these different maps into a single comprehensive and accessible map would help policy actors to find common understanding between them. The existence of a single authoritative map would also help the government to enforce laws more effectively, as an important impediment to palm oil-related law enforcement is the overlapping of maps and authorities.

Beyond reforms by the government, other policy actors, such as NGOs, palm oil companies and palm oil growers, must continue efforts to find common ground. Rather than continuing to antagonise other parties, it is important that all policy actors begin by recognising the concerns of both camps, as presently embedded in the source of destruction and trade war narratives adopted by them. Initiatives to find common ground, such as the 'land-swapping' proposal by the WRI[121] and the cooperation between GAR and Greenpeace, must be welcomed and encouraged.

Endnotes

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28 The trial, conducted by Deli Maatschappij, showed that the species grew even better than in its original habitat. See, Palm Oil Agribusiness Strategic Policy Institute (PASPI), *The sustainability of Indonesian palm oil industry*, op. cit., 11. This result was in accordance with the observations of Adrian Hallet, a Belgian agricultural engineer. See, Berger and Martin, 'Palm oil', op. cit.

29 Berger and Martin, 'Palm oil', op. cit.

30 Palm Oil Agribusiness Strategic Policy Institute (PASPI), *The sustainability of Indonesian palm oil industry*, op. cit.

31 Ibid.

32 Larson, 'Indonesia's palm oil subsector', op. cit.

33 Ibid.

34 Under this scheme, the government assumed responsibility for infrastructure development and facilitated the acquisition of property rights. Contractors could then take responsibility for land clearing, usually in exchange for logging rights. The government provided an incentive for the private sector by granting them credit at concessionary rates. The credit was to be used for estate development, new crop planting and processing facilities. Around the estate nucleus, the government sponsored smallholder development, with a composition of a 20 per cent/80 per cent mix between estate area and smallholder area. The government provided financing to the smallholder plantings and initial living costs (most of them were transmigrants from Java). See, Larson, 'Indonesia's palm oil subsector', op. cit

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43 President Yudhoyono's visit to the *Rainbow Warrior*, the famous ship of Greenpeace, on 8 June 2013, was lamented by Tungkot Sipayung of GAPKI and Asmar Arsjad of the APKASINDO (*Asosiasi Petani Kelapa Sawit Indonesia*; or, Indonesian Palm Oil Growers Association) as a sign of 'foreign power's control over the nation'. Interviews with Asmar Arsjad, General Secretary of APKASINDO, 19 June 2014, and Tungkot Sipayung, Head of the Advocacy Division of GAPKI, 15 July 2014. The President's visit to the *Rainbow Warrior* was also criticised by GAPKI through various outlets, such as in the Journalist and Student Workshop, 'Meluruskan Persepsi Negatif Industri Kelapa Sawit Indonesia', op. cit.

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69 Ibid., 3; Greenpeace, 'How Unilever palm oil suppliers are burning up Borneo', op. cit., 2–5.

70 See for instance, Greenpeace, 'Meminta Komitmen Penuh Nestle Untuk Menghentikan Sinar Mas dari Penghancuran Hutan Indonesia', 24 March 2010, http://www.greenpeace.org/seasia/id/news/minta-komitmen-penuh-nestle-un/.

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72 FGD with Greenpeace, WRI and Sawit Watch, op. cit. Activists from other NGOs, such as Sawit Watch, responded with supportive nods, too.

73 Greenpeace, 'Caught red handed', op. cit.

74 It is important to note though that, although plantations owned by big businesses and state-owned companies make up 49 per cent and 8 per cent of the total plantation area, respectively, there are many smallholders growing oil palm, too — around 43 per cent of the oil palm plantation area is owned by smallholders, who are direct recipients of oil palm expansion and revenue growth. This argument is made use of by GAPKI and palm oil companies to develop their own narrative that oil palm is Indonesia's 'national interest'. See, Sipayung, 'Peranan Industri Persawitan dalam Pertumbuhan Ekonomi, Pembangunan Pedesaan, Pengurangan Kemiskinan, dan Pelestarian Lingkungan', op. cit.

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81 For instance, one of these workshops, titled 'Meluruskan Persepsi Negatif Industri Kelapa Sawit Indonesia', was organised by *Radar Malang* and sponsored by GAPKI.
82 Interview with Tungkot Sipayung, op. cit.
83 Interview with Hikmat Soeriatanuwijaya, op. cit.; FGD with Greenpeace, WRI and Sawit Watch, op. cit.
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100 Sipayung, 'Peranan Industri Persawitan dalam Pertumbuhan Ekonomi, Pembangunan Pedesaan, Pengurangan Kemiskinan, dan Pelestarian Lingkungan', op. cit.; Palm Oil Agribusiness Strategic Policy Institute (PASPI), *The sustainability of Indonesian palm oil industry*, op. cit.

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102 See, for example, 'GAPKI Menentang Kampanye Hitam Greenpeace', *Indonesian Market Quotes*, 21 October 2013; Ibid.

103 As observed by the author during the Journalist and Student Workshop, 'Meluruskan Persepsi Negatif Industri Kelapa Sawit Indonesia', op. cit.

104 Interview with Tungkot Sipayung, op. cit.; Presentations at Journalist and Student Workshop, 'Meluruskan Persepsi Negatif Industri Kelapa Sawit Indonesia', op. cit.

105 Interview with Joko Supriyono, op. cit.

106 Interview with Hikmat Soeriatanuwijaya, op. cit.

107 FGD with Greenpeace, WRI and Sawit Watch, op. cit.

108 Interview with Tungkot Sipayung, op. cit.; Presentations at Journalist and Student Workshop, 'Meluruskan Persepsi Negatif Industri Kelapa Sawit Indonesia', op. cit.

109 For example, some articles on the Ministry of Agriculture website propose steps to fight the 'black campaign' against palm oil. See, http://pse.litbang.deptan.go.id/ind/pdffiles/Pros_2012_05B_MP_Bambang.pdf.

110 Lestari, 'Isu Lingkungan Tidak Pengaruhi Produksi Sawit', op. cit.

111 Ibid.

112 *Surat Pimpinan Komisi IV DPR RI kepada Pimpinan Badan Legislasi DPR RI No. 004/Kom. IV/I/2010 tanggal 22 Januari 2010 perihal konsultasi Pimpinan Komisi IV DPR RI dengan Pimpinan Baleg DPR RI mengenai dua RUU prioritas untuk tahun 2010, yaitu RUU tentang Kelautan dan RUU tentang Pencegahan dan Pemberantasan Pembalakan Liar* [Letter from the Commission IV of the Indonesian House of Representatives No. 004/Kom. IV/I/2010].

113 Bustar Maitar of Greenpeace in the public hearing session of the House of Representatives with NGOs on the draft of the Law on the Prevention and the Elimination of Illegal Logging, 10 October 2010.

114 *Pendapat Akhir Fraksi-Fraksi terhadap RUU Pencegahan dan Pemberantasan Pembalakan Liar* [Final remarks by the fractions on the draft of the Law on the Prevention and the Elimination of Illegal Logging], 15 November 2011.

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116 The benefit from crude palm oil being included in the Environmental Goods list is from the associated maximum tariff of 5 per cent for all Asia-Pacific Economic Cooperation (APEC) member economies. See, http://apec2013.or.id/index.php/read/c/2013/10/06/1324/Palm-Oil-Joins-the-Environmental-Goods-List.

117 'SBY Berharap Presiden Baru Lanjutkan Moratorium Hutan dan Lahan', accessed 29 September 2014, http://www.mongabay.co.id/2014/05/05/sby-berharap-presiden-baru-lanjutkan-moratorium-hutan-dan-lahan/.

118 'Hari Ini Presiden SBY Diangkat Jadi Presiden GGGI', op. cit. As mentioned at the beginning of the chapter, the Indonesian President was referring to palm oil when alluding to 'Indonesian products'.

119 Cabinet Secretariat, Republic of Indonesia, 'Bertemu Presiden Uni Eropa, Jokowi Minta Dibantu Masuknya Kelapa Sawit Indonesia ke Eropa', accessed 25 January 2015, http://setkab.go.id/bertemu-presiden-uni-eropa-jokowi-minta-dibantu-masuknya-kelapa-sawit-indonesia-ke-eropa/.

120 Anne Rosenbarger, Ariana Alisjahbana and James Anderson, '"Swapping land" to produce sustainable palm oil in Indonesia' (Washington, D.C.: World Resource Institute, 2013), accessed 2 May 2015, http://www.wri.org/blog/2013/10/%E2%80%9Cswapping-land%E2%80%9D-produce-sustainable-palm-oil-indonesia#recommendations.

121 Due to the gap between the legal classifications of forest area and the reality of land cover on the ground, much of the land that is legally available for palm oil and other development is unsuitable due to the presence of high-conservation value forests, peat or conflict with communities. On the other hand, much of the already degraded, low-carbon land that would be suitable for sustainable palm oil is legally off limits to development. Land-swapping means changing the legal classification of a particular forest area (which has potential for sustainable oil palm plantation, but is legally off limits) and swapping it with another forest area (that is legally available, but actually unsuitable for sustainable palm oil development). See, Ibid.

Chapter Four

Valuing the Invaluable: Challenges in Using Total Economic Value to Estimate the Value of Natural Resources in the Salween River Basin

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Hydropower has been endorsed by the ASEAN Economic Community as an important factor for achieving energy security to support economic growth in Southeast Asia. The ASEAN community, as a whole, as well as individual country members have developed power development plans specifying hydropower goals and endorsing environmental sustainability objectives. Thailand and Myanmar, having recognised the energy potential of the Salween River, have signed memoranda of understanding to build a series of large hydropower dams. However, official impact studies have not accounted for the economic value of natural resources that may be damaged by these projects, and local communities' values and preferences for natural resources have largely been excluded from official planning. This study attempts to quantify the economic value of ecosystem goods and services that may be lost due to the construction of the proposed Salween dams.

The total economic value framework has been used in this case study of the Hatgyi hydropower project, a dam planned closest to the Thai-Myanmar border. A discrete choice experiment was used to elicit economic values at Sob Moei village in Thailand, 47 km upstream of the Hatgyi site, in June and July 2014. Data limitations posed a challenge to meeting all research objectives, but the exercise provides important pointers for further valuations work in the region. Notably, the study highlights the need for new economic value models that can be applied in collaborative decision-making settings. Increased access and security and stronger networks for researchers in the region are also stressed. A framework for future research is proposed such that the total economic value of natural resources can be captured in the debate on the use of large dams to achieve energy security in the Salween River region.

Keywords: ASEAN hydropower, environmental goods and services, environmental valuation, natural resource damage assessment

Biography

Liliana Camacho is an affiliated researcher with the York Centre for Asian Research (YCAR) at York University, Toronto, Canada. Her research supports YCAR's programme on New Directions in Environmental Governance in Southeast Asia by using applied economic theory. She is also a senior manager of environment, measurement and evaluation at Mennonite Economic Development Associates (MEDA), working to promote solutions to poverty through entrepreneurship in developing countries. At MEDA, Liliana has provided analytic support and advised on environmental strategy for various projects focused on agricultural value chains and women's economic empowerment funded by Canada's Department of Foreign Affairs, Trade and Development.

Prior to joining MEDA, Liliana was an economist and policy advisor with the federal department of environment in Canada, Environment Canada, where her work included modelling and analysis of environmental and economic effects of policy decisions; economic analysis and negotiation support for national submissions to the United Nations; and, coordination of environmental projects with various partners in Latin America. She played a central role in supporting the economic valuation of biodiversity protection under the federal Species at Risk Act.

Liliana earned her Master's degree in Economics at McMaster University, Ontario, Canada, where she took an interest in development and international economics. Previously, she studied international business administration at the Schulich School of Business at York University in Canada and at the Institut Européen d'Etudes Commerciales Supérieures de Strasbourg in France.

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The views expressed in this paper are the author's own.

1. Introduction

ASEAN has formally identified hydropower as a key component of its future energy targets and an important factor for regional integration. The ASEAN community, as a whole, as well as individual country members have drawn up power development plans specifying hydropower goals and endorsing environmental sustainability objectives. Thailand and Myanmar — neighbouring countries and trade partners in energy — having recognised the potential of the Salween River's water resources for achieving these goals, have signed a number of memoranda of understanding on large dams that are to be built in Myanmar and connected to Thailand's energy grid.

However, along with this promise of a cleaner energy future comes opacity with regards to financial flows, environmental damage and human costs from large dam development. The economic value of ecosystem damages at the dam sites have not been systematically studied or accounted for in official documents or by major stakeholders. This study attempts to quantify the economic value of ecosystem goods and services (EG&S) that may be lost due to the construction of one of the proposed Salween mega-dams. It employs a total economic value (TEV) framework for identifying ecosystem benefits provided to riverine residents and uses a conditional logit model to estimate the utility and economic value of these benefits.

The chapter begins with a background on the ASEAN community's energy goals as well as a review of Thailand and Myanmar's hydropower policies to provide a context on the Salween dam project. This is followed by a discussion of the TEV framework and the methodology employed for estimating economic value of EG&S. The article concludes with a discussion of the results and a framework for further valuations research at the Salween River's dam sites.

2. Background

2.1 ASEAN energy agenda

ASEAN has been undergoing a process of accelerated regional integration since 2007, with the signing of the ASEAN Economic Community (AEC) blueprint at the 13th ASEAN Summit in Singapore.[1] This vision of integration sees the region transformed into a single market and production base, participating as one unit in the global economy by 2015.[2] The Master Plan on ASEAN Connectivity (MPAC) describes integration through three facets — physical infrastructure, institutions and people.[3] The physical infrastructure theme includes energy infrastructure, with an objective to meet growing demand for power in the region.

The energy agenda is formally embodied in the ASEAN Plan of Action for Energy Cooperation (APAEC). The first APAEC was developed for 2010–2015, with the specific objective of enhancing energy security and sustainability in the ASEAN region.[4] Its theme, 'Bringing policies to actions: Towards a cleaner, more efficient and sustainable ASEAN energy community', emphasised quick action on, among other aspects, an ASEAN-wide power grid, renewable energy and regional energy planning. Subsequently, a renewed plan, the APAEC 2016–2020, was endorsed in Vientiane in 2014 by the ASEAN Ministers of Energy.[5] The new theme, 'Enhancing energy connectivity and market integration in ASEAN to achieve energy security, accessibility, affordability and sustainability for all', continues to focus on regional power distribution, renewable energy and sustainable development.

Renewable energy, in particular, receives special attention in the two APAEC documents mentioned above. The new plan confirms the renewable energy targets stipulated in the original APAEC undertaking: (i) to achieve a 15 per cent renewable energy share in the ASEAN power generation mix; and, (ii) to develop ASEAN as a 'hub' for renewable energy.[6]

International Rivers, a non-governmental organisation (NGO) advocating for the sustainable use of rivers worldwide, investigated the meaning of 'energy security' to better understand the APAEC theme. Four dimensions of this term were evident in the literature: (i) availability of energy resources; (ii) affordability; (iii) efficiency (emissions intensity reduction); and, (iv) environmental stewardship (protection of the environment for future generations).[7] The implication of this goal for ASEAN members is evident — regional and domestic energy planning that aligns with APAEC goals must ensure that actions taken to increase renewable energy generation are accompanied by conservation practices to secure long-term sustainability of natural resources.

2.2 Thailand and Myanmar: Assessing the cost of planned projects

Thailand is in a unique position to become such a 'hub' due to its well-developed transmission and distribution infrastructure, its economic performance, and its central location in Southeast Asia. Although Thailand currently relies on hydropower (a source of renewable energy) for only 5 per cent of its total energy supply, its energy policies emphasise capacity gains through hydropower imports from neighbouring countries. Despite its current small share of the energy supply mix, hydropower is an important component of Thailand's future energy supply — the country's most recent power development plan lays out a target of 29 per cent of total hydropower generation capacity by the year 2030.[8] Moving towards a greater proportion of hydropower (and other renewables) in its generation mix will allow Thailand to reduce its reliance on depletable natural gas, which currently comprises 71 per cent of total capacity. The United States Energy Information Administration's (US EIA) most recent

publication on Thailand's energy statistics highlights the country's gradual depletion of its natural gas stores and need for an alternative to the high rate of imports of natural gas.[9] For a country that aims to be the hub of the ASEAN grid, this is a worrying projection. Much of the future energy capacity will be imported hydropower from neighbouring countries in the Greater Mekong Subregion (whose mega-dams are already under development and whose questionable sustainability practices have received ample attention in the media[10]) and, potentially, the Salween River, which is the longest undammed river in Southeast Asia.

Myanmar, Thailand's neighbour and home to most of the Salween River Basin, is also developing new energy policies to align with MPAC. Myanmar is significantly less developed, in economic and energy terms, than neighbouring Thailand. Its electrification rate is an average 26 per cent, with more than 60 per cent of its largest city connected to the grid but with some rural areas lit only by propane lanterns.[11] The country relies on biomass for 75 per cent of its energy supply, 90 per cent of which comes from forest wood. Although Myanmar is rich in natural resources, its goals of rapid industrialisation require more sustainable energy sources. Deforestation becomes an issue with such heavy reliance on biomass, which is particularly exacerbated by illegal logging in border areas. The country has recognised hydropower as a potential source of both electricity and export revenues. Although its current generation capacity is 2,520 megawatts (MW), the country's Ministry of Electric Power has identified 300 potential hydropower projects that could increase future capacity by a total of 46,331 MW. Six proposed mega-dams[12] on Myanmar's Salween River would contribute thousands of megawatts to its generation capacity and export revenues.

The official list of future ASEAN power grid projects recognises joint collaboration between Thailand and Myanmar in the area of energy and natural resources. The 'Thailand-Myanmar project', for which details are largely left out of the APAEC documents, is proposed to begin in 2016. This project likely comprises the oil and gas pipelines in operation as of 2014, as well as future mega-dams. The Salween dam projects

in Myanmar could help both countries achieve better energy security, but questions have been raised regarding environmental sustainability, public consultation with local residents near the dam and human rights atrocities, particularly in Myanmar's conflict-ridden Karen State.[13]

Plans for building the Hatgyi hydropower project (Hatgyi), the closest of the proposed dams to the Thai border, are embodied in a non-binding memorandum of understanding between Thailand and Myanmar. Investors for this USD 2.6 billion hydropower project include the Thailand Ministry of Energy, Myanmar Ministry of Electric Power, Electricity Generating Authority of Thailand (EGAT), China's Sinohydro Corporation and a private Myanmar company, the International Group of Entrepreneur Pte. Ltd. (IGE), with suspected links to the *Tatmadaw* (Myanmar Armed Forces).

Public meetings about the dam in Thailand have taken place in Sob Moei province, the closest province to the proposed dam location, although these have been riddled with discontent among local residents.[14] No known public consultation has occurred near Myanmar's banks of the Salween, perhaps due to safety concerns of EGAT employees.[15] Clearing of land has begun in Karen State, involving forceful displacement of residents into internally displaced peoples' camps, according to media and NGOs.[16] An environmental impact assessment (EIA) was conducted by EGAT and Chulalongkorn University's Environmental Resources Institute (ERI) in 2008, but was poorly received by the local Thai community and concerned environmentalists, as it failed to analyse environmental impacts in Thailand.[17] EGAT is currently conducting an EIA in Thailand; draft versions claim that only two households in the country could be affected by high levels of water in the dam reservoir. Additional seismic risks attributed to the fault line under the Salween River are cause for future concern. However, local communities are unaware of this geographical feature and of the extent of damages caused by a dam collapse (the risks of which are heightened by seismic movement).[18]

The EIA does not provide a monetary estimate of potential environmental damages in Myanmar or Thailand caused by dam construction and

reservoir flooding. At best, household relocation costs amount to '$3,000' without mentioning inflation, base year or calculation methods.[19] A recent study from the University of Oxford on large dams enumerates the cost and time overruns typical of large dams built worldwide. Ansar et al. found that actual costs were underestimated by an average of 96 per cent and time underestimated by an average of 2.3 years.[20] No official systematic study on the value of the Salween to local residents' well-being and livelihoods has been conducted in order to ascertain how residents may be adversely affected by the project, or the amount of compensation (in-kind or monetary) that would allow them to maintain their present quality of life. With the environment as a public good — free to use and therefore 'free' to damage — Thailand and Myanmar run the risk of severe environmental damage and loss of resources for future generations of Salween riverine residents.[21] While 1,360 MW of electricity may bring the countries closer to their renewable energy targets, the APAEC goal of sustainable development (including environmental stewardship) appears largely at risk of being ignored.

Economic tools may provide some answers in this development quandary, particularly the TEV framework that identifies EG&S and attempts to estimate their value to humans. TEV has been used in court cases in Canada[22] and has proven to be a suitable framework for estimating environmental damages caused by projects or actions, above and beyond simple market costs.[23] Using TEV can allow interested parties to understand the payoffs necessary for a dam project to make economic and socioeconomic 'sense': that is, will the project create value for all stakeholders above and beyond all costs, and what is the value of natural resources that would be lost via this undertaking? Transparent, well-governed ASEAN institutions and funding partners should take into account the costs and benefits of the Salween mega-dams to evaluate the dams not just on a project level but also in the context of energy security, including the sustainability goals stipulated in the AEC blueprint and APAEC 2016–2020.

This study attempts to provide a value to EG&S vis-à-vis the Salween River at the Hatgyi dam site such that stakeholders and interested parties

can understand the value of its natural resources to local residents. Limitations of data and access, and the unsuitability of presently used economic methods in the context of collaborative decision-making cultures proved to be challenges to achieving all initial research goals. The present exercise, however, does lend itself to a framework for further valuations at the study site, and will be of use to others conducting participatory research on hydropower projects and the value of environmental damages in the Salween River.

3. Methodology

3.1 A history of environmental valuation

The concept of environmental valuation emerged in the economics literature in the late 1940s, building upon the theory of welfare economics that had been developed decades earlier through Pigou's theory of externalities (1920) and Hicks and Kaldor's work on compensation (1930).[24] Welfare economics became the foundation of cost-benefit analysis, which economists employed for analysing government efficiency.[25] Valuation soon emerged in an attempt to include environmental impacts in standard cost-benefit frameworks.[26] Seminal works by Hotelling[27] and Ciriacy-Wantrup[28] highlighted the possibility of quantifying the value of recreational goods and natural resources. Valuation was later used to quantify contributions of the environment to income and well-being.[29]

The quantification of impacts on the environment, whether through market values or via inference, provides policymakers with valuable information and increases their confidence in decision-making.[30] An economic approach to environmental valuation should take into account the perspectives of all affected stakeholders rather than adopt one viewpoint, such as that of the government or the investor.[31] The need for an inclusive community perspective is driven by the essence of cost-benefit work — this analytical approach is designed to formalise 'important social facts that might otherwise escape private and public attention'[32]; or, to 'evaluate projects in terms of their net effects on social welfare'[33]. Environmental assets have proven a challenge to measure

through cost-benefit analysis as they lack a market to generate prices. The TEV framework was developed to systematically address such non-market goods.

3.2 TEV

Environmental economists worldwide have adopted the TEV concept, which measures changes in environmental goods and services in monetary terms.[34] The approach measures use values as consumptive or non-consumptive uses by an individual. It also measures non-use values that arise from the knowledge that the environment will be maintained in its current state for enjoyment by present and future generations.

TEV is used by federal policymaking institutions in Canada and the UK to assign economic values to EG&S.[35] These institutions use TEV to capture the 'true value' of EG&S affected by policy decisions or stakeholder actions.[36] The United Nations Environment Programme (UNEP) defines EG&S as

> [T]he benefits people obtain from ecosystems … includ[ing] *provisioning* services such as food and water; *regulating* services such as flood and disease control; *cultural* services such as spiritual, recreational and cultural benefits; and *supporting* services, such as nutrient cycling, that maintain the conditions for life on Earth.[37]

TEV accommodates various methodologies for valuation that are suitable for different data and literature availabilities, value types (i.e., use or non-use), and the resources available to complete a valuation study. The methods are listed in the order of least to most complexity, with the value types they can each accommodate, in Table 4.1. These approaches can measure both willingness of a respondent to pay for an ecosystem good or service ('willingness-to-pay', or WTP), and/or their willingness to accept compensation for the loss of an ecosystem good or service ('willingness-to-accept', or WTA). In a case where extensive ecosystem damages are expected to occur, the literature strongly suggests that WTA is the preferred measure of value.[38]

Table 4.1: Total economic value approaches, measures and suitability for the Hatgyi site.

Approach	Measure	Suitability for present study
Revealed preference approaches: Use values		
Market price, averting behaviour, travel cost approach	WTP	WTP unsuitable for environmental losses; not suitable for full range of potential value
Hedonic pricing	WTP or WTA	Not suitable for full range of potential value
Stated preference approaches: Use and non-use values		
Contingent valuation	WTP or WTA	Suitable for measuring potential non-use values from Salween resources. Price referendum is potentially limited by income levels, can be conceptually confusing for developing countries and may be biased if referendum prices are ill-constructed[39]
Choice modelling/discrete choice experiments	WTP or WTA	Allows for elicitation of preferences independent of prices, avoiding income limitations or biases. Suitable for measuring potential non-use values from Salween resources. Presentation of options is potentially confusing for respondents[40]
Revealed and/or stated preferences: Use and non-use values		
Benefits transfer	WTP or WTA, depending on available literature	No English-language study of a similar policy decision or political and geographical context available on which to base a value or function transfer

WTA = willingness-to-accept; WTP = willingness-to-pay

A literature search for studies on which to base a benefits transfer approach was conducted on the Environmental Valuation Reference Inventory[41] (EVRI), a global environmental valuation database hosted by Environment Canada. The database contained only ten valuation studies of hydropower dams for irrigation, electricity or flood control, with all but one of the studies estimating WTP, a measure unsuitable for the present study in the face of expected environmental damages at the Hatgyi site. The one valuation study that looked at a similar decision on compensation for damages from

a hydropower plant construction in Vietnam did not use primary data nor did it survey local residents at the plant site.[42] Thus, the option to use the benefits transfer approach for the Hatgyi site was not available.

3.3 Discrete choice experiment: An attribute-based stated preference method

Instead of the benefits transfer approach, a choice modelling method — which is an attribute-based method[43] — was used to estimate perceptions of value for Salween EG&S in this study. Attribute-based methods solicit, rather than observe, preferences from respondents and can circumvent income biases through indirect estimation of WTA or WTP for EG&S.

The US Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) endorsed the use of attribute-based methods in the late 1990s to model preferences for compensation of environmental gains and losses.[44] These experimental methods have been used to estimate preferences and economic value of restoration of ecosystems in Florida[45] and hybrid vehicles in California[46]. They are accepted as a TEV methodology by the UK's Department for Environment, Food and Rural Affairs (Defra), and Environment Canada.[47] Other choice modelling techniques have been used to estimate non-use values (for instance, Rolfe and Windle's study on indigenous community preferences for cultural heritage protection in the Fitzroy Basin in Australia[48]), and to understand indigenous people's preferences between development and conservation[49].

The particular attribute-based method used — a discrete choice experiment — was adapted to a developing country setting following Whittington's[50] suggestions for settings where low income levels could affect ability and willingness to pay for a good. Whittington recommends using clear language, simple hypothetical settings and longer deliberation time to ensure that respondents understand the questionnaire administered as part of the experiment. Accordingly, the questionnaire in this study was

administered in the Thai and Karen languages and used graphics to convey information. No time limits were given for response elicitation. Translators used ad hoc questions to check respondents' understanding and rephrased information when needed.

4. Application of Discrete Choice Experiment to the Hatgyi Site

4.1 Sample profile

The total population in Ban Sob Moei (Sob Moei village), approximately 900 people, resides in four neighbourhoods. Most residents are farmers of vegetables, rice and tobacco, or fishermen. The selection of respondents proved challenging, as persons without Thai citizenship (roughly 60 per cent of Sob Moei residents) are not registered in a census or formal survey, and associated income data is not recorded in municipal, provincial or federal documents. Constructing a census or population survey though was out of scope of this project. Participation in the study was solicited through the village leader and local schoolteacher, and did not follow a representative sampling technique. For this reason, the present study should only be seen as an exercise in environmental valuation and as a starting point for future research.

Experiment participants were mostly from the central neighbourhood in Sob Moei village, which is relatively wealthier and better educated than the surrounding three neighbourhoods. The adult population of the central neighbourhood is on average 50 per cent literate. Of the 25 adults who participated in the experiment, 23 were farmers. Two farmers also had a second occupation — school cook and village leader, respectively. One participant was a vendor and another a public health worker. Among the participants, 60 per cent were women and 40 per cent men. Figure 4.1 presents the age distribution of the discrete choice experiment participants.

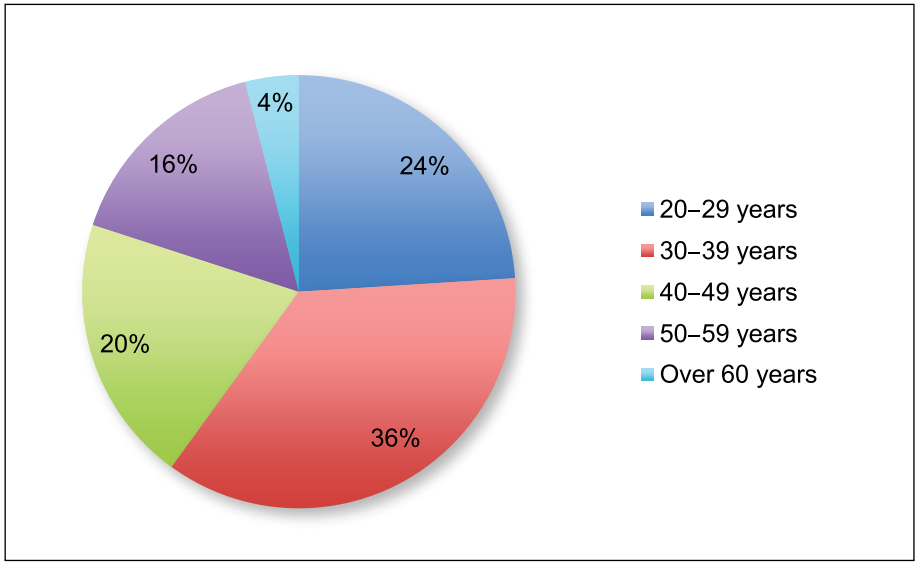

Figure 4.1: Age distribution of survey participants (n = 25).

Source: Primary data gathered at Sob Moei village, July 2014.

4.2 Application to the Hatgyi site near Sob Moei village

Using a discrete choice experiment to estimate the values for EG&S impacts requires data on individual preferences. These data were collected during two focus groups and interviews in June and July 2014. Data collection focused around two outcomes: (i) to identify the EG&S that were valuable to villagers; and, (ii) to estimate monetary values of each ecosystem good or service.

EG&S at Sob Moei village. EG&S were solicited at a focus group in July 2014 using the brainstorming question, 'What benefits do you get from the natural resources around your home?'. This question was asked orally in Thai to 16 adults invited to the session by the village leader.

Respondents were then asked to rank the elicited benefits in the order of importance using cue cards numbered 1, 2, 3 and 4, with number 1 representing the most important attribute and number 4 representing the least important one. Figure 4.2 shows the responses gathered, weighted for importance and ranked in the descending order.

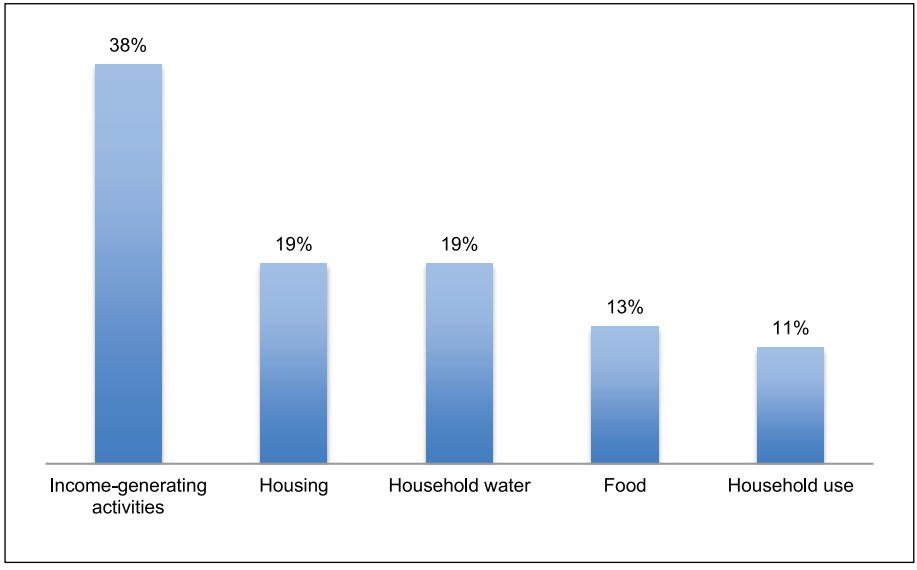

Figure 4.2: Identification and relative ranking of environmental attributes among elicited responses.

Source: Primary data gathered at Sob Moei village, July 2014.

The EG&S elicited in the focus groups are categorised using TEV in Figure 4.3.

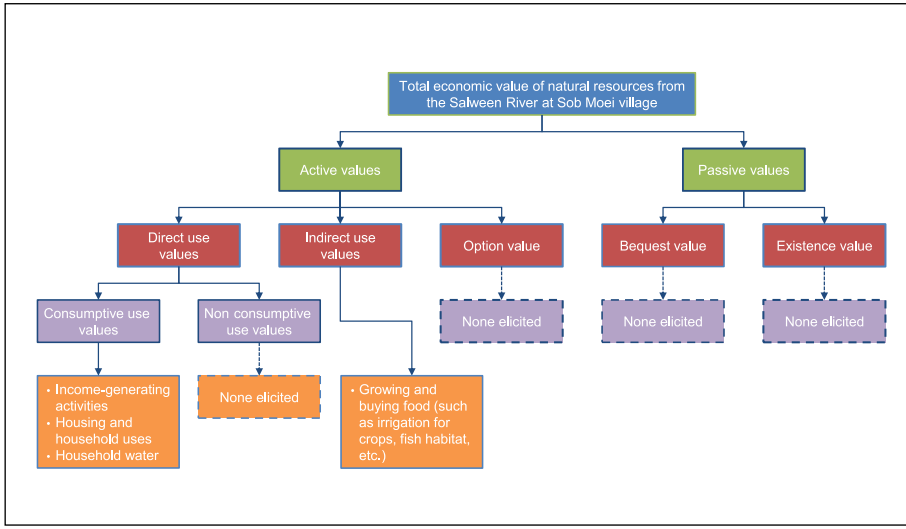

Figure 4.3: Total economic value illustrated for the Salween River's natural resources at Sob Moei village.

Source: Adapted from Department for Environment, Food and Rural Affairs (Defra), *An introductory guide to valuing ecosystem services* (London: Defra Publications, 2007), 30; Primary data gathered at Sob Moei village in June and July 2014.

4.3 Impacts on attributes

The EG&S identified by respondents are outlined in Table 4.2 along with definitions in the economic development literature. Potential impacts to these EG&S were then referenced with ERI's 2008 EIA and used to construct the experiment that was then administered to respondents. Appendix 4.1 contains a comparison of EG&S descriptions from the perspective of local participants versus definitions contained in the literature.

Table 4.2: Definition and potential impacts to EG&S due to Hatgyi dam construction.

Ecosystem good or service (Attribute)	Definition in the literature
Income-generating activities	International Labour Organization: A 'catch-all term' referring to activities that 'result in a sale or barter'[51]
Housing materials	Office of the United Nations High Commissioner for Human Rights: Materials to ensure protection from elements, such as cold, damp, heat, rain and other hazards[52]
Household water	United Nations Department of Economic and Social Affairs: Water that is clean, safe from health threats, physically accessible to households and affordable[53]
Growing and buying food	United Nations Special Rapporteur on the Right to Food: The existence of an enabling environment in which people can produce or purchase adequate food for themselves and their families[54]
Other household uses	This attribute was grouped with 'Housing materials' due to similarities in environmental impacts

EG&S = ecosystem goods and services

It should be noted that 'recreational', 'cultural' and 'religious' uses of water were not identified by the villagers. Boating and swimming had commercial purposes in Sob Moei village and leisure swimming by adults was uncommon.

4.4 Presentation of EG&S options

For the discrete choice experiment, ecosystem benefits identified by villagers and referenced with the 2008 EIA were presented as a set to 25 experiment participants. The benefits were then assigned two potential damage levels according to the expectations of dam effects described in the EIA. Four relocation scenarios were created, with each scenario consisting of three EG&S options — two options contained a unique combination of damage levels at a new relocation site and a third 'choose neither' option was added as, according to the literature, providing a 'choose neither' option prevents respondents from feeling forced to select an option that does not reflect their preferences. The options presented to respondents were determined using an orthogonal factorial design.[55] Survey participants were asked to choose among potential relocation sites based on the 'fairness' of distribution of ecosystem benefits at each

site.[56] Table 4.3 outlines the EG&S options given to respondents under relocation scenario 1 in the order they were presented.

For simplicity, the measurement unit used for all EG&S was a proportional change relative to the current availability of the benefit. For example, clean water at a new site could be available only half as frequently versus present availability in Sob Moei. For a full tabulation of benefits and attribute levels, refer to Appendix 4.2.

Table 4.3: EG&S options under relocation scenario 1.

EG&S	EG&S option under relocation scenario 1		
	1A	1B	1C
Income-generating activities	High: Crop variety, fish variety, fish availability (quantity) similar to current state	Low: Crop variety and fish variety (quantity) reduced by half; fish quantity reduced by 25% versus current state	Choose neither
Housing and household uses	High: Area of forested land available for furniture and housing materials reduced by 25%	Low: Area of forested land available for furniture and housing materials reduced by 50%	
Household water	High: Sedimentation and bacteria levels similar to current state; well water level similar to current state	High: Same as option A	
Growing and buying food	High: Crop abundance and nutrition similar to current state; fish caught for personal consumption as large and nutritious as current state	High: Same as option A	
Subsidy	High: Respondent's household receives 75% of housing costs incurred by relocating to a new area	Low: Respondent's household receives 50% of housing costs incurred by relocating to a new area	

EG&S = ecosystem goods and services

5. Results

5.1 Observations

Group participation and dynamics. A pivotal observation was that decision-making in Sob Moei village is a group activity, in alignment with Karen cultural norms. Although respondents were asked to independently

select their preferred options from the given relocation scenarios, they always consulted one or more participants before responding to focus group questions. The village leader suggested that this was reflective of the decision-making culture of the community, where a committee decides on administrative issues by consensus.

Villagers were hesitant to participate in the focus group, with one elder remarking, 'we have no rights; you people don't listen to us anyways'[57]. This lack of rights refers to the lack of full Thai citizenship that is a reality for many Karen villagers. This should be considered by government ministries, academics, EGAT and ERI when carrying out public consultations on dam construction, as officials may be unaware of resentment or fear preventing full participation by some border area residents.

Access limitations. During the planning and interview stages of the study, NGOs and experts working on Salween issues advised against conducting research near the Hatgyi site in Myanmar due to concerns for safety and logistics. It was suggested by some experts that this area could be reached illegally and that ample time spent living in the communities would help to earn their trust. Such an approach was, however, out of scope of this study.

The research team was unable to gain access to Karen State to speak with Myanmar residents around the study site. Some Myanmar villagers near the dam have been displaced in preparation for building and relocated to camps in Karen State. These camps are located near Tatmadaw bases and are not easily accessible by outsiders. Therefore, the research observations presented herein should be assumed to only apply to the village where the survey was conducted and not be generalised to Myanmar villagers along the river. Further research could investigate geospatial differences in economic value and impacts on damage compensation, should accessibility permit.

Conflict also affected access to the Salween shoreline in Thailand after the military coup on 22 May 2014, and the increased military presence

along the Thai-Myanmar border delayed access to the site. Army presence in Sob Moei may also have deterred participation by villagers without citizenship. As instability is a reality in the region, researchers should consider possible consequences when executing field surveys.

Limitations to data. Data were limited by three main factors — consensus-based responses, misunderstanding of relocation scenarios and EG&S options, and possible protest responses. Although these limitations did pose a challenge to fulfilling some of the study's stated research objectives, its findings do offer valuable insights on research in the Salween River basin and the suitability of economic tools for communities with a collaborative decision-making culture.

First, although respondents were asked to select among options independently, the participants discussed among themselves prior to making a choice. This made it impossible to assess individual preferences, as the possibility of influence on one respondent's choice by other participants could not be eliminated. In keeping with Whittington's[58] guidelines, the village leader was kept separate from other respondents to avoid the leader's bias on villagers' decisions.

Second, all respondents selected a relocation option that was not welfare maximising in scenario 4. The option that was not selected contained more of each ecosystem benefit than the option that was selected by all respondents. According to the theory of welfare maximisation, individuals prefer more of a benign good than less of it. Given the choice between more ecosystem benefits to less, all respondents should have selected the option with more benefits. All respondents also selected the 'choose nothing' option for relocation scenario 3, such that the option did not provide preference data and could not be used. This unexpected behaviour could point to a misunderstanding of either the exercise or the options presented.

Third, the selection of non-welfare maximising choices could be interpreted as a form of protest. The standard treatment for protest responses is to drop these responses from further analysis.

Upon running the conditional logit analysis on the data set, it was evident that these limitations impeded a full valuation of the ecosystem benefits. The direction of the 'subsidy' variable, a benign good that respondents should prefer more of, rather than less, was negative in this cohort. This indicates that respondents would rather receive less money or no money if a compensation policy were to be applied. This is not in alignment with economic theory.

Further, it was impossible to estimate utility values for all ecosystem benefits in any one model run. The model of best fit (described in Appendix 4.3) produced utility estimates for only three of the four benefits presented to the respondents. The model of best fit indicated that respondents placed the highest value on clean water whereas the direct ranking of benefits at a focus group revealed that income-generating activities were preferred over other benefits.

5.2 Implications

Despite the data constraints that limit observations regarding utility and value, the study offers insights on research in the Salween River basin and the suitability of economic tools for communities that have a collaborative decision-making culture.

Quantitative values of EG&S at the Hatgyi site. Suspected invalidity of collected data lead to insufficient evidence for completing all objectives of this valuations exercise. More data should therefore be collected through field-tested surveys with a representative sample from upstream and downstream villages in Thailand and Myanmar. A deeper understanding of group decision-making behaviour typical to Karen culture should be developed prior to making conclusions on the value of EG&S at Sob Moei village. TEV theory should be adapted to allow for application to cultural situations where collective decision-making is the norm.

Enhancing economic tools. The TEV approaches used in this study, while commonplace in policy shops in Canada, US, UK and Australia, prove

limited in this setting. Research on collaborative decision-making cultures has revealed various distinctions between motivators for individual and collective choices. As already reflected in the decision theory embodied in TEV, individual motivators lie in maximising utility or profit; collective choices, however, can be driven by reputation, group cohesion, group conformity and the influence of others.[59] Research by Janis has suggested that individuals are apt to change their original decisions upon joining a group.[60] Some factors for changing original individual decisions may be group experience or expertise and group membership.[61]

Zander and Garnett's research with groups in Australia on WTP for natural resources management found differences in preferences between indigenous and non-indigenous peoples.[62] Spyce, Weber and Adamowicz found differences in preferences for environmental conservation between Aboriginal and non-Aboriginal groups in Yukon, Canada.[63] Aboriginal groups tended to prefer greater generational equity of natural resource distribution (protecting the environment for future generations) than non-Aboriginal groups.

Adapting TEV approaches to reflect differences between individual and group decision-making would necessitate testing of the random utility theory in group settings. As further explained in Appendix 4.4, the random utility theory is based on the concept that the utility of a choice is separable into observable and unobservable (random) utility. Some observed group behaviour would need to be explained by the attributes of: (i) the ecosystem good or service in question; and, (ii) the decision motivators of a group.

In developing and testing adaptations to economic models that account for the nuances of collective decision-making, it may be important to note that some researchers have observed that an individual's preferences are relatively stable in a collective decision if that individual has faced a similar (independent) decision prior to the group decision.[64] Field-testing a model could involve testing this observation in collaborative decision-making cultures (e.g., issuing the same survey at Sob Moei to

households followed by a group exercise). Two surveys could also test what the absence of the 'choose nothing' option reveals and whether respondents used the option as a form of protest or a way of avoiding having to take an individual decision. The consequences of eliminating a 'choose nothing' option would need to be evaluated in the context of decision theory to ensure that it would not lead to bias that could not be controlled for in some way.

6. Policy Implications

TEV contributes to the overall impact pathway of policy decisions. The UK model, adopted by Environment Canada, is outlined in Figure 4.4.

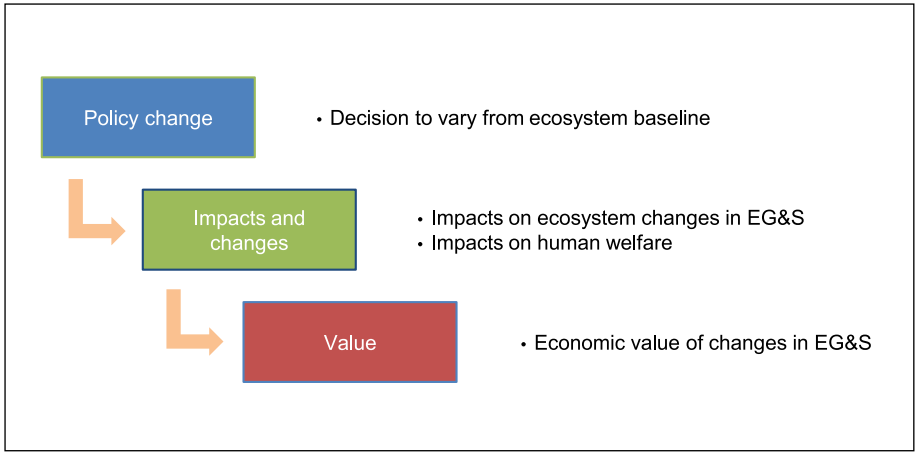

Figure 4.4: Impact pathway of environmental policy decisions.

EG&S = ecosystem goods and services

Source: Adapted from Department for Environment, Food and Rural Affairs (Defra), An introductory guide to valuing ecosystem services (London: Defra Publications, 2007), 22.

TEV provides a framework through which to quantify the economic value of changes in EG&S, depicted as the last step in the impact pathway. The economic value can then be used to support evidence in a formal cost-benefit analysis, which informs Cabinet-level decisions in Canada. Insights from this study are applied to policymaking in the discussion below.

6.1 Result 1: Need for adaptation of economic models of collective decision-making within the TEV framework

Current participatory methods do not accommodate collaborative decision-making and are not sensitive to participation bias (e.g., political or ethnic) of certain groups. Economic models of decision-making that accommodate for the influence of outsiders on an individual should be developed by academics and field-tested in consensus-based cultures. New decision-making models that are based on the random utility theory can be incorporated in the TEV framework and used in collaborative decision-making contexts, as necessary. This is an opportunity for Canadian and ASEAN researchers to create working partnerships to develop such models — Canadians can bring experience with Aboriginal communities while ASEAN researchers could offer experiences with various ethnic groups, such as the Karen community. Such research could combine theory and methods from economics, psychology and anthropology.

6.2 Result 2: Improve access for researchers and strengthen existing networks of researchers in the Salween River basin

Access limitations posed a challenge to gathering a representative sample of respondents in this study. Thai villages were physically easier to access, but a representative sample was difficult to design and construct without access to census data or demographic study and within a limited time frame. Researchers must have access to all potentially impacted stakeholders regardless of country or type of citizenship. Access for Salween researchers could be endorsed by ASEAN and international academics and institutions. Support for carrying out studies in the region should be extended to include safe transportation and lodging in rural areas, perhaps provided by a network of researchers already familiar with the Salween villages. Established programmes, such as the Economy and Environment Program for Southeast Asia (EEPSEA) and ASEAN-Canada Research Partnership, could leverage existing contacts to help new researchers access difficult areas, build an active network of Salween researchers and put forth resources to collect

new data for participatory economic research on natural resources in this region. The Salween-Thanlwin-Nu (STN) Studies Group, which met in November 2014 at Chiang Mai University, Chiang Mai, Thailand, could build a virtual hub to connect researchers in and outside of the area and provide access and translation support to researchers. Importantly, security for researchers could be extended by government officials in consultation with academics or research funding agencies.

6.3 A framework for further valuations research in the Salween River basin

The aforementioned aspects needing improvement can be more formally developed into a framework for further research. Both the adapted methodology and improved access will allow future valuations work to be carried out in the field at the Salween dam sites. These two policy implications can be implemented concurrently, as illustrated graphically in Figure 4.5.

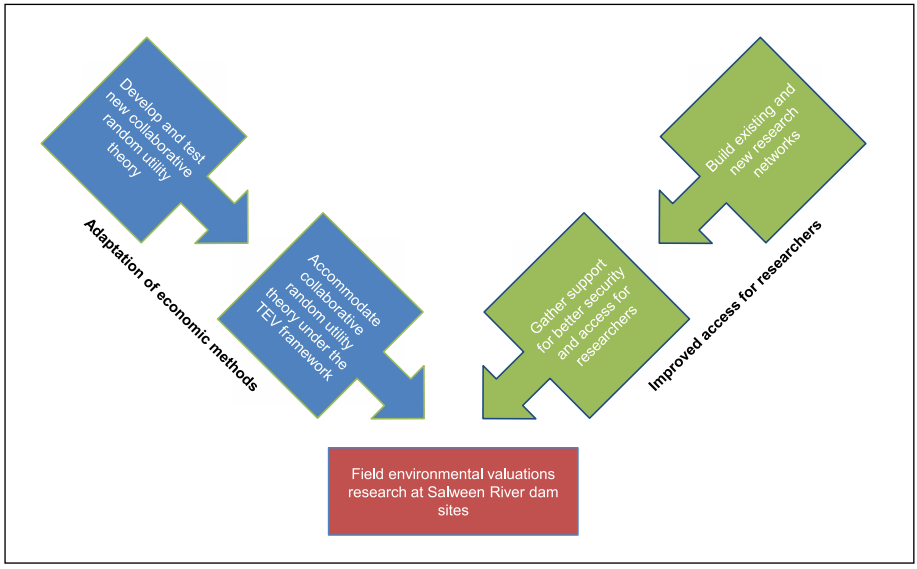

Figure 4.5: Framework for further valuations research in the Salween River basin.
TEV = total economic value

7. Conclusion

The objective of this study was to use the TEV framework to estimate the economic value of EG&S in the Salween River, such that local stakeholder preferences could be captured in the discussion on hydropower development. Results were limited by data, methods and accessibility obstacles. However, the exercise revealed certain challenges that should be solved in order to move ahead with further work of this nature. A framework delineating a path forward to address the limitations with economic tools and accessibility provides actionable recommendations for specific stakeholders. It is hoped that researchers, academics and government officials in the Salween River basin collaborate in order to make future valuations research possible at the dam sites. As hydropower development gains speed and energy policies are proposed to achieve regional goals, it is of utmost importance to ensure that environmental sustainability and inclusive integration remain a focus in meeting the ASEAN community's goals for the future.

APPENDICES

Appendix 4.1: Definition and potential impacts to EG&S due to Hatgyi dam construction.

Table 4.1A: EG&S, as defined by Sob Moei villagers and the literature, and potential effects from dam construction and/or operation.

EG&S	Villager comments	Definition in the literature	Potential effects from Hatgyi
Provisioning service: Income-generating activities	Responses included 'selling vegetables', 'selling fish' and 'selling in the market'	International Labour Organization: A 'catch-all term' referring to 'activities … that result in a sale or barter … involve a production skill that results in a product for sale or barter, … processing activities … and support activities'[65]	Soil erosion, reducing fertile agricultural land
			Higher water levels, reducing agricultural land acreage

			Higher bacteria levels, reducing quality and variety of fish
Provisioning service: Housing materials and household uses	Materials identified for construction of houses included bamboo, banana leaves and timber, purchased in market or gathered in the wild; materials identified for furniture and decoration	Office of the United Nations High Commissioner for Human Rights: Natural materials used for construction of housing that provides 'habitability', protection from elements, such as cold, damp, heat, rain, protection from disease vectors and other threats to health, and protection from structural hazards[66]	Deforestation of surrounding forests to allow for construction, reducing quantity of materials for housing and household uses
			Soil erosion, decreasing quality and quantity of trees
			EGAT plans to launch reforestation activities upon completion of construction
Provisioning and supporting service: Household water	Water used for cooking, cleaning and washing.	United Nations Department of Economic and Social Affairs: Clean, safe from health threats, physically accessible and affordable[67]	High level of sedimentation in water
			Contamination from construction material (such as chemicals, gasoline or cement)
			Lower well water levels
			Higher bacteria in the water due to sedimentation and standing water around the reservoir
Provisioning service: Growing and buying food	Refers to food produced and food purchased in market. A variety of vegetable crops grow in the riverine area (such as pumpkin, tomato, long beans, eggplant, etc.) while rice grows in flat paddies and the hills	United Nations Special Rapporteur on the Right to Food (Olivier De Schutter): The right to food includes the existence of an enabling environment in which people can produce or purchase adequate food for themselves and their families[68]	Erosion, reducing quality of soil and creating unstable slopes along riverbank crop beds
			Changes in nutrient content of soil requiring a change in crop variety
			Permanent flooding to surrounding reservoir land, immersing crops
			Blockades or other changes to fish migration patterns likely to change, changing availability of nutritious fish

EG&S = ecosystem goods and services; EGAT = Electricity Generating Authority of Thailand

Appendix 4.2: EG&S from the Salween River — Discrete choice experiment (as presented to respondents) at Sob Moei village, July 2014.

Table 4.2A: Answer key reflecting possible extent of damage to EG&S, as presented to respondents.

EG&S	(Relatively) High	(Relatively) Low
Income-generating activities	Crop variety, fish variety, fish availability (quantity) similar to current state	Crop variety and fish variety (quantity) reduced by half; fish quantity reduced by 25% versus current state
Housing and household uses	Area of forested land available for furniture and housing materials reduced by 25%	Area of forested land available for furniture and housing materials reduced by 50%
Household water	Sedimentation and bacteria levels similar to current state; well water level similar to current state	Sedimentation level higher than current, making the river sandy; higher level of bacteria such that boiling is necessary before cooking, cleaning and drinking; well water level reduced by half
Growing and buying food	Crop abundance and nutrition similar to current state; fish caught for personal consumption as large and nutritious as current state	Crop abundance and nutrition reduced by half; fish caught for personal consumption smaller and less nutritious versus current state
Subsidy	Your household receives 75% of housing costs incurred by relocating to a new area	Your household receives 50% of housing costs incurred by relocating to a new area

EG&S = ecosystem goods and services

Table 4.2B: Relocation scenarios presented to respondents.
[Refer to Appendix 4.1 for definitions of each ecosystem good or service listed in the table headings and Table 4.2A for the possible extent of '(Relatively) high' and '(Relatively) low' damages for each EG&S]

Relocation scenario	Alternative	Income-generating activities	Housing and household uses	Household water	Growing and buying food	Subsidy
1	A	High	High	High	High	High
	B	Low	Low	High	High	Low
	C	Choose neither				
2	A	High	Low	Low	High	Low
	B	Low	High	High	Low	High
	C	Choose neither				

3	A	High	Low	High	Low	High
	B	Low	High	Low	High	High
	C	Choose neither				
4	A	Low	Low	Low	Low	Low
	B	High	High	Low	Low	High
	C	Choose neither				

EG&S = ecosystem goods and services

Appendix 4.3: Econometric output of the model of best fit.

Resp ~ IGA + Housing + HHWater + Food + Subsidy + strata(ID)						
n = 225, number of events = 75						
	Coeff	**Exp(coef)**	**SE(coef)**	**Z**	**Pr(>|Z|)**	
IGA	1.3291523	3.7778395	0.5352161	2.483	0.013014	*
Housing	2.0231240	7.5619113	0.6220012	3.253	0.001144	**
HHWater	2.3019297	9.9934481	0.5788332	3.9770000	6.98E-05	***
Food	NA	NA	0.0000000	NA	NA	
Subsidy	-0.0008675	0.9991329	0.0002404	-3.6090000	0.000308	***
Signif. codes:	0 '***'	0.001 '**'	0.01 '*'	0.05 '*'	0.1	
	Exp(coef)	**Exp(-coef)**	**Lower 0.95**	**Upper 0.95**		
IGA	3.778	0.2647	1.3233	10.785		
Housing	7.5619	0.1322	2.2345	25.5906		
HHWater	9.9934	0.1001	3.2137	31.0756		
Food	NA	NA	NA	NA		
Subsidy	0.9991	1.009	0.9987	0.9996		
R-square: 0.362 (max possible = 0.626)						
Likelihood ratio test = 101.2 on 4 df, p = 0						
Wald test = 27.56 on 4 df, p = 1.533e-05						
Score (logrank) test = 67.2 on 4 df, p = 8.848e-14						

IGA = income-generating activities; HHWater = household water; NA = not available; Strata = variable used for identifying individual respondents

(a) R-Studio was used to analyse the data.

* P < 0.05 was considered statistically significant.

** P < 0.01 was considered statistically significant.

*** P < 0.001 was considered statistically significant.

Appendix 4.4: Conceptual framework — Random utility theory.

The discrete choice experiment is grounded in McFadden's random utility theory[69], which models 'rational' decision making behaviour and decomposes one complex decision into various simple decisions. In this case, the complex decision is the utility of an overall resettlement bundle, and each simple decision is the utility of individual components of the resettlement bundle. The theory provides a mathematical technique to convert the utility of each individual component into a monetary value, and allows aggregation of the individual components into a monetary value of the total resettlement bundle.

Random utility theory assumes a person's utility (or welfare or satisfaction) is comprised of one observable, measurable part and a second unobservable, random part. This theoretical background enables economists to interpret decision-making as a way to maximise measurable utility under certain constraints (usually a budget). Based on this theory, utility of a decision takes the following form:

$u_i = v_i + e_i$ (1)

where, u_i is total utility, v_i is observable utility and e_i is unobservable, random utility.

The random term is assumed to be comprised of characteristics of the respondent and attributes of the good or service in question. Formula (1) is referred to as a conditional indirect utility function, *conditional* on the choice of '*i*' over any other item '*j*'. Here, *i* and *j* are components of a policy set *C* denoting various resettlement options. Each policy contains a different combination of ecosystem goods and services (EG&S; attributes) and levels of usage of each EG&S. The set of EG&S used in this study were gathered on-site in Thailand.

Note that 'random utility' is indeed random, such that only the probability of selecting a policy can be estimated. The probability that a given policy is selected is:

$Pr(i\ chosen) = Pr\{V_i + e_i > V_j + e_j\}$ (2)

where, all *j* belongs to the policy set *C*.

Randomness also implies that certain assumptions need to be made about the error term. In the literature, the distribution of the error term is assumed to be Weibull, a heavy-tailed distribution.[70] This implies a conditional logit model should be used to specify the probability of selecting a certain choice *i*:

$Pr\{i\} = e^{V_i} / \Sigma\ e^{V_j}$ for all *j* belonging to policy set *C* (3)

In the process of estimating the probability of choosing a given policy option, estimates of utility for alternative EG&S (attributes) are produced. Software, such as R-Studio, which was used in this analysis, computes utility estimates. These can be aggregated to produce an overall estimate of a resettlement option.

A simple calculation can transform each individual utility value into willingness-to-accept (WTA) estimates for each environmental service within a resettlement package. If β_i represents the marginal utility of an increase in one unit of attribute *i*, WTA can be found by dividing the marginal utility of *i* by the marginal utility of an attribute specified in monetary terms. This study used a subsidy on housing materials as the denominator, conceptualised as a proportion of the total cost of constructing a new house:

$Marginal\ WTA(i) = \beta_i / \beta_m$ (4)

where, β_m is the marginal utility of an increase of 1 per cent in the subsidy level.

Individual WTA of a given compensation package for a change in the services provided by the Salween River can be calculated by summing the marginal WTA of a change in each EG&S in the compensation package (i.e., all components within the β vector).

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Chapter Five

Enhancing Water Use Efficiency for the Sustainable Development of the Cambodia-Laos-Vietnam Development Triangle: Case Study of the Central Highlands of Vietnam[1]

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The Central Highlands of Vietnam (CHV) are part of the Cambodia-Laos-Vietnam Development Triangle (CLVDT). The regions share similarities in nature, culture and societies, and are strategically important in terms of politics, economy, society, eco-environment, defence and security. The CHV is prone to natural disasters, such as droughts, floods, landslides, fires, etc. Besides the overuse and inefficient use of water, inefficient irrigation methods and over-development of hydropower dams, droughts are a critical cause of water shortage in the region, especially for the winter-spring crops.

This research aimed to: (i) explore the extent of water shortage in the region; (ii) analyse its impacts on agriculture; and, (iii) suggest solutions for enhancing water use efficiency for its sustainable development. Using a multidisciplinary approach, the study found that water shortage in the region was severe and badly affects its agricultural productivity (especially for coffee and other industrial crops), daily living and other economic uses. Every year, shortage of water caused by drought damages thousands of hectares of industrial crops (such as coffee, pepper and cacao), in turn causing declines in household income and people's living standards, and impacting the sustainable development of the CHV and CLVDT regions.

Recommendations for enhancing water use efficiency in the region include: (i) structural measures (water planning in the basin, and irrigation and drainage systems based on water demand); (ii) non-structural measures (identification of plant types, crop schedules, water management and forest plantation); and,

(iii) technical measures (policies of water pricing, institutional reform on water management and education provided to farmers on how to use proper and efficient methods of irrigation to conserve water). All these measures could help save water resources and reduce the amount of water used for irrigation while still yielding high productivity of crops, thus ensuring sustainable development for the region in the future.

Keywords: Cambodia-Laos-Vietnam Development Triangle, Central Highlands of Vietnam, shortage of water, sustainable development, water use efficiency

Biography

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1. Nguyen Huy Hoang, 'Environmental degradation and people's living standards: The case of ethnic minority groups in Moc Chau, Son la, Vietnam', *Journal of Science: Economics and Business* (forthcoming).
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1. Introduction

1.1 Background

The region of Cambodia-Laos-Vietnam Development Triangle (CLVDT) is prone to natural disasters, such as floods and droughts. The frequency of floods and droughts in the region seems to have increased in recent years.[2] Drought has become increasingly severe in the region causing shortage of water in the dry season, especially for the winter-spring crops. In other words, water shortage has led to decreased productivity in terms of agricultural production, and affects people's living conditions and other economic activities in the region.

Much the same as the CLVDT, in recent years, drought and water shortage in the Central Highlands of Vietnam (CHV) have had increasing and severe effects on the region's development and are threatening its agricultural production, in general — especially the agricultural production of smallholder farmers in the region planting coffee and other industrial crops.[3] Recent statistics reveal that, during the dry seasons

of 2004–2005, 2010–2011 and 2012–2013, water levels in all rivers in the region were the lowest recorded for 37 years.[4] As availability of water during the growth season is a limiting factor for the region, limiting water losses and increasing water use efficiency for agriculture, coffee plantations and other economic activities are but essential — this will not only help to boost the production of industrial crops (such as coffee, cacao, pepper and others) and agricultural productivity, in general, but also make more water available for people to use.

As water is primarily used in the region for agriculture and daily living purposes, the present research confined its analysis to the use of water as a resource for agricultural activities (especially for the production of coffee and other industrial crops) in the CHV. Due to similarities between the CHV and the provinces of Cambodia and Laos in CLVDT with regard to nature, culture and society, as well as water supply and agricultural activity, the findings of this case study of the CHV can be applied to the entire area of CLVDT with some clarifications.

The objectives of this chapter were to: (i) explore the extent of water shortage in the region; (ii) analyse its impacts on agriculture; and, (iii) suggest solutions for enhancing water use efficiency for its sustainable development.

The chapter is divided into four sections. Following the introduction, the causes of drought and shortage of water for agricultural and industrial crop production in the CHV region are elaborated. The subsequent section outlines recommendations for increasing water use efficiency and, finally, the last section summarises key findings.

1.2 Overview of the region

CLVDT is the border junction area of three countries — Cambodia, Laos and Vietnam — and comprises of five provinces from Vietnam's CHV, four Cambodian provinces and four provinces of Laos.[5] The CLVDT has a natural area of 143,900 km^2 and a population of 6.7 million, with a population density of 46 people per km.[6] The region shares much

similarity with regard to nature, culture and societies, and is strategically important for all three countries in terms of politics, economy, society, eco-environment, defence and security. It has strong potential for economic development, especially for industrial crop growing and processing, natural mineral extraction and processing, and tourism. With continuous efforts and close cooperation between the governments of the three countries, the CLVDT region has achieved significant progress in socioeconomic development since its establishment in 2004. Recent statistics of the region show that its rate of gross domestic product growth was higher than the average rates of Vietnam, Laos and Cambodia.[7] A positive shift is being affected in its economic make-up, with an increasing share of non-agricultural activities. The living standards of people in the region have seen gradual improvement. Similarly, its infrastructure and connectivity have also been upgraded, enabling the regions to better connect with each other and those outside, bringing about more socioeconomic development.

The most advantageous economic activity in the CLVDT region is the planting of industrial crops, especially coffee, pepper and cacao, which are also its main sources of income. With recent infrastructural development following the formation of CLVDT, the prospects for industrial development in the region have improved. However, very few industrial facilities are currently operating in the CLVDT and CHV — for instance, the bauxite exploitation and mineral extracting factory in the Dak Nong province of Vietnam or certain industrial crop processing mills that are spread over the CHV — and there is considerable scope for further growth of the region's industrial sector. Given this, water use for industrial purposes is negligible in the region.

The CHV — which consists of five provinces, namely Kon Tum, Gia Lai, Dak Lak, Dak Nong and Lam Dong (from the north to the south) — combines with the South Central Coast to form the South Central region of Vietnam. Featuring basaltic soils (about 2 million hectares [ha] of fertile basalt, accounting for 60 per cent of Vietnam's total basalt area) at altitudes of 500–600 m, the CHV is ideal for growing industrial crops, such as coffee, cocoa, pepper, cashew and rubber. Coffee is the region's

most important industrial crop, and includes some famous brands, such as Trung Nguyen and Buon Ma Thuot coffee. Besides, the CHV is also home to the second largest rubber plantation in Vietnam.

Given its numerous waterfalls, hydropower is a viable resource that has been increasingly and efficiently tapped with the construction of several hydropower plants — large and small — in the region. On the flip side, this may have impacted the region's water supply and become a cause for its frequent droughts and floods. Other than the above, CHV's economy is not as developed as other regions in Vietnam — lack of highly skilled labour, poor infrastructure and its mountainous terrain are some factors that restrict its economic development.

Climate. The regions of CLVDT and CHV belong to the Indochina Peninsula and are embedded in the Asian monsoon system, with the South Asian summer monsoon (SASM) and the northeast Asian winter monsoon bringing the wet (rainy) and dry seasons, respectively.[8] The wet season occurs from early May to mid-October whereas the dry season is from November to April, with peaks in March and April every year. Early rainfall over the region is associated with the appearance of strong convection currents indicating the start of the SASM.[9] March and April are the hottest and driest months in a year. Due to altitude, the climate in the plateaus, at heights of 400–500 m, is relatively cool and rainy while, at altitudes over 1,000 m, weather remains cool all year round, similar to the temperate regions.

The inter-annual variation of rainfall is mainly caused by westward propagating weather disturbances that materialise as short-wave train anomalies emanating from the western tropical Pacific[10] and an east-west inter-annual seesaw responding to the Walker circulation for the Indo-Pacific inter-annual interaction[11]. Moreover, rainfall in the summer is a result of the northward seasonal migration of the rain belt, which is referred to as the inter-tropical convergence zone.[12]

The inter-annual variations of rainfall are mainly influenced by seasonal winds. The annual rainfall in the CLVDT and CHV ranges from 1,500–

2,400 mm.[13] Monthly rainfalls from May–October account for about 80 per cent of annual rainfall. The average monthly rainfall during the rainy season exceeds 200 mm, with peak rainfall in August and September due to tropical cyclones and typhoons. Air temperature ranges from 20°C to 25°C. The highest temperatures are observed in April and May, corresponding to the rapid warming of the landmass that causes the onset of the SASM with atmospheric circulation over the mid and low latitudes.[14]

With such characteristic climate, the CHV and CLVDT usually face water shortages in the dry season, or from November to April, and this does severely impact and damage economic activities in the region.

Water resources. The main sources of water supply for agricultural activity, household use and livestock in the CHV come from nearly 400 reservoirs, rivers systems and underground water in the region. The catchments of Sesan and Srepok rivers spread from its mountainous areas, at an average elevation of 500–1,000 m above mean sea level westward toward the Mekong River system in Cambodia. The Sesan catchment is nearly 11,400 km long, with annual rainfall varying from 1,500–2,300 mm and annual evapotranspiration of about 1,000–1,400 mm.[15] Its most upstream areas have rocky and hard soils that lead to direct rainfall contribution to discharge. The catchment of Srepok spreads over an area of 12,500 km^2, with steep upstream westward slopes of rocky and hard soils leading to direct rainfall contribution to discharge. The annual evapotranspiration is in the range of 1,000–1,400 mm and annual rainfall is approximately 1,600–2,400 mm in the area.[16] The catchment of Ba River spreads over 13,900 km^2 along the eastern parts of the CHV. The river rises from the northern mountain range, flows eastward over the flat plateau, at an average elevation from 300–500 m above mean sea level, and through the coastal area to the East Vietnam Sea.[17] The annual rainfall is about 1,700–2,000 mm and annual evapotranspiration ranges from 1,000–1,500 mm, with maximum evapotranspiration in March and April (range, 120–200 mm per month).[18]

As the distribution of rainfall is not consistent throughout all seasons of the year, the CHV and CLVDT regions always face shortage of water for agricultural activity, especially during the dry season and for the winter-spring crops. For this reason, cutting back on the usage of water in the water-scarce region during the dry season has been a focus of regional efforts toward sustainable development.

2. Drought and Water Shortage: Causes and Impacts

Drought, a problem for CHV during the dry seasons, peaks in March and April every year. Droughts and overuse of water have caused severe water shortage for agricultural and industrial cropping in the region, thus harming its sustainable development. In recent years, scorching hot and longer dry seasons have been the cause of severe water shortage. Although droughts occur in all cultivation seasons, it is more frequent during the winter-spring crop season.

As many farmlands do not have irrigation systems and underground water has not been tapped for agricultural use, the severity of droughts is mainly governed by the region's weather conditions. In fact, during droughts in the dry season in CHV, it is common for the many rivers and streams that supply water for agricultural activity, such as irrigation, and domestic consumption to completely dry out. Worsening droughts have threatened agricultural production, affecting community life and weakening the provincial economy. According to statistics provided by the provinces in CHV, since 1980, droughts have become more frequent in the region, with severe droughts occurring at intervals of 4–5 years (for instance, in 1983, 1988, 2003, 2005, 2009 and 2013).[19] The cropping area affected by droughts has accordingly increased from 2,000 ha to 15,000 ha during this period. The 1998 drought was the most severe, causing severe shortage of water for the winter-spring crop of paddy rice spread over 10,700 ha.[20]

2.1 Causes of drought

As observed by the Vietnam Institute of Meteorology, Hydrology and Climate Change and National Hydro-Metrological Centre — Hydro-meteorological Observatory for the Highlands region, the many causes of droughts in the region are outlined below.

Natural factors. Droughts, a natural hazard[21], are a consequence of a water availability deficit during certain periods of time. According to statistical records obtained from the Vietnam Institute of Meteorology, Hydrology and Climate Change, droughts observed in the CHV since the 1980s are associated with changes in global weather patterns and regional factors, such as deforestation. Rainfall over the CHV is abundant, but not well temporally distributed through the year, being concentrated during certain months of the rainy season that account for nearly 80 per cent of the annual rainfall. Rainfall in the region is mainly governed by the SASM, the inter-tropical convergence zone and typhoons, which are influenced by large-scale circulations. These circulations combined with surface characteristics, such as topography, lead to different precipitation distributions and hydrological mechanisms over the region.[22] A break phase or a delayed onset of SASM and variability in the strength and location of the inter-tropical convergence zone might lead to drought occurrence over the CHV. The phenomenon of El Niño southern oscillation (ENSO) has significant influence on weather over Vietnam, in general, and the CHV, in particular, and teleconnections between such global phenomena and drought occurrences over Vietnam have been the subject of extensive research[23], which has concluded that droughts over Vietnam are strongly related to ENSO. In other words, droughts in the CHV are also partly caused by ENSO.

Man-made factors. While droughts are mainly caused by the global weather changes discussed above, the latter is precipitated by various factors, including human activity, that can influence and change the climate significantly.[24] Considering this, the lack of well-defined and relevant policies in many developing countries could either cause or aggravate drought situations.[25]

With rapid population growth and rising demands in the region, forested land in the CHV has been increasingly converted for arable and residential use. As data provided by the General Statistics Office of Vietnam (GSO) show, population in the CHV has increased around fivefold from 1,225,000[26] to 5,464,110[27] people during 1976–2013, or in just 40 years. However, production activities and land use have been based merely on short-term objectives instead of any long-term strategy for environmental protection and sustainable development[28] — a major reason behind the region's unsustainable land use patterns and natural resource management, which has only served to increase its potential vulnerability to drought events.

Furthermore, in response to increasing demands for electricity, Vietnam has, in recent years, constructed several hydropower stations on the rivers in the region. By the end of 2013, for instance, there were 11 large-sized hydropower plants and some 360 small-sized ones being built.[29] Such development has come with widespread deforestation, which in turn has caused high rates of evaporation and decreased amounts of water reserves, all adding to droughts and water shortage in the region.

In general, long-term planning has lagged behind development plans for natural resource utilisation in the CHV, whether concerning land use, forests, water resources, biodiversity or other purposes. The same applies to legal documents and guidelines for institutions, all of which amount to less local resource mobilisation and encouragement with regard to exploitation and management of natural resources. Moreover, planning, management and decision-making at the local level in the CHV do not fully meet the requirements for sustainable economic development, enhancing the region's vulnerability to droughts per se.

Overuse of resources by people, be it for economic activities or daily living, has also played its part. As a free-of-cost natural resource, water is used without due consideration for its conservation, for the future as well as for use during the drought season. This finding draws attention to the urgent need for measures that address water conservation with high efficiency.

In short, there are several factors causing water shortage in the CHV region, all of which may be equally important. Keeping these in mind, authorities need to find solutions to ensure the region's sustainable development while conserving its water resources.

2.2 Impacts of drought

Statistical data from the Vietnam Institute of Meteorology, Hydrology and Climate Change show that the impact of droughts on the environmental and socioeconomic sectors of Vietnam, in general, and the CHV, in particular, are comparable to damages caused by floods and typhoons.[30] A deficit of rainfall over a certain period, in combination with high temperatures and highly potent evaporation, may lead to huge deficiencies of water supply in the region that may morph subsequently into large-scale drought with widespread effects (such as loss of agricultural production, emergence of forest fires and reservoir depletion, or even famine, diseases and conflicts, etc.).

Prolonged droughts can seriously affect society, as ecological and economic impacts are always closely linked together with social impacts.[31] Due to the paucity of data on all sectors affected by drought events in Vietnam and the CHV since the 1980s, very little information could be obtained on the severe drought event following the 1997–1998 El Niño episodes, which has been considered as the strongest such event of the 20th century. However, most provinces in CHV were significantly affected by severe drought, with adverse impacts on people's livelihoods and the economy. According to a drought assessment by Trần Đăng Hồng on the Viet Sciences, during 1997–1998, about 3 million people were affected and total losses in terms of agricultural production were nearly USD 400 million.[32] Diseases due to lack of food, poor water sanitation and hot weather were observed. Some diseases became epidemics as well — for instance, nearly 250,000 people were infected by dengue fever in Vietnam.[33] Although no official data are available on other sectors (such as fishing and ecosystem losses, recreation and tourism, etc.), all were considerably affected.

According to the Department of Agriculture and Rural Development of Kon Tum, Gia Lai, Dak Lak and Dak Nong, the provinces in CHV have seen a series of drought events during 1994–2013 that have affected its winter-spring crops. The widespread drought event of 1997–1998, for instance, caused huge losses in agricultural production in the CHV — nearly 24,000 ha of winter-spring crops were badly affected and over 7,800 ha were completely destroyed.[34] Where the summer crops were concerned, over 13,000 ha were affected and more than 2,000 ha were entirely destroyed. In all, over 110,000 ha of other perennial industrial plants were affected by the drought event and about 20,000 ha of these crops were fully destroyed. Data shows that the 1997–1998 drought event was clearly related to ENSO — rainfall in the 1998 rainy season was about 10 per cent to 50 per cent lower than normal, causing widespread water shortage in the CHV and the country, as a whole. There were 60 forest fires in the CHV during the first half of 1998, which destroyed over 1,500 ha of forests.[35] Prolonged drought also led to water shortage and depletion in almost all of the region's reservoirs, with nearly 800,000 residents facing lack of freshwater.[36]

Similarly, a drought event from February–April 2012 affected 14,380 ha of crops, of which 6,767 ha were severely damaged. Droughts continued in the CHV during May–August 2012, and destroyed about 6,200 ha of the summer-autumn rice paddies, 4,460 ha of seasonal rice paddies, 28,210 ha of vegetables, and 1,360 ha of fruit and industrial plants.[37] In 2013, the CHV region saw a drought event during November and December — which occurred simultaneously with a drought in the South East central region — that damaged 11,000 ha of crops.[38]

According to Ministry of Agriculture and Rural Development of Vietnam (MARD), in the South Central region and CHV, rainfall levels dropped 50 per cent to 90 per cent in 2014 compared to the first three months of 2013.[39] Meanwhile, water levels in the region's reservoirs reached only 60 per cent to 70 per cent of their designated capacity. Overall, nearly 27,000 ha of the 2013–2014 winter-spring crops in the CHV region were badly affected by drought.[40] According to data from the Dak Lak Province's Sub-department of Irrigation, drought damaged over 5,500

ha of crops, including 4,000 ha of rice and 450 ha of coffee, with losses totalling nearly VND 93 billion (or, USD 4.4 million).[41]

In the Dak Nong Province, drought caused damage to 240 ha of rice and 1,860 ha of coffee during the winter-spring season.[42] Over 20 reservoirs in the province's districts, including Krong No, Cu Jut and Dak Min, had no water to irrigate 2,500 ha of coffee, cacao and other industrial trees. Water shortage in the region would become more severe should such hot weather patterns continue in the face of no water conservation efforts by farmers, causing much harm to its agricultural production.

3. Recommendations for Enhancing Water Use Efficiency

Water use efficiency is important for the future sustainable development of the CHV and CLVDT regions. Water use efficiency is understood as any measure that reduces the amount of water used per unit of any given activity, consistent with the maintenance or enhancement of water quality.[43]

Cheesman and colleagues found that, with regard to the use of water for agriculture and industrial crops and water shortage, the shortage of water in the CHV frequently occurred due to droughts and overuse by people for farming activities and daily living.[44] They also found that coffee smallholders in the Dak Lak plateau and CHV were technically and allocatively inefficient irrigators overusing water for irrigation, implying that there was scope for both a reduction of irrigation water input use per tree per season and for rescheduling irrigation to achieve higher output with the same water input. Findings suggest that shifting from the usual irrigation schedule practised by coffee smallholders to a technically efficient one would lift output per hectare from around 4.5 metric tonnes, on average, to 5.2 metric tonnes. Simultaneously, adopting allocatively efficient water application would reduce average seasonal irrigation input per tree in the plateau from 4,000 L to 1,700 L — all measures that could be undertaken without lowering output or output quality. A per tree irrigation input reduction would translate into irrigation water reduction of up to 2,500 m^3 per ha and annual input reduction of 340,000 million L for the coffee smallholder sector in the plateau. To put these figures

in perspective, a reduction of 340,000 million L is roughly equivalent to 30 per cent of the plateau's average annual recharge to the region's unconfined aquifer. In other words, if such measures were applied to the entire CHV region, large amounts of water could be saved annually for agricultural crops.

The measures outlined below for water use efficiency in the CHV can be extrapolated to the entire CLVDT region.

3.1 Non-technical measures: From water resource management perspectives

Scarcity of water due to droughts is affecting agriculture and certain other major economic sectors in Vietnam and the CHV alike. Drought mitigation measures need to apply an integrated approach that involves the most suitable drought-resistant crops, with minimum water demand, and better management and regulation of water distribution. Drought mitigation measures should include a comprehensive survey and evaluation of water resource management, the main objective of which should be to supply enough water in terms of both quality and quantity for livelihood, agricultural production and promoting the sustainable use of water. From the perspective of water resource management, two clusters of solutions — structural and non-structural measures — are recommended.

Structural measures. Structural measures of water resource development and management deal with water deficit. Water development planning for each basin, and irrigation and drainage systems should take into account the water demand for daily living and economic purposes as well as environmental protection. These measures play an important role in water allocation and water supply due to the region's complex topography, temporal and spatial rainfall distributions, and varying water demand. For good and efficient management of water resources, the following measures need to be well implemented.

First, reservoir development is the most important measure to warrant water security for cultivation, living and the environment. Among others, improving the storage capacity of available reservoirs and building

new ones to recharge groundwater, retain surface water and reduce evaporation need to be considered and implemented to enhance water regulation capabilities during the rainy and dry seasons.

Second, mobile pumping can effectively alleviate drought when irrigation systems are not fully developed. The quantity and capacity of these pumps in an area or an irrigation system is dependent on factors such as the area regularly affected by droughts, volume of water that can be used, topography, and the average duration of droughts.

Third, detailed knowledge is required of the water requirement per unit of crop in the region to put in place efficient irrigation regimens. Practical studies have found that water usage coefficients of irrigation systems in the CHV lay in the 0.5–0.65 interval due to high losses by infiltration and evaporation in cases where water is being transported and/or used.[45] Therefore, improvements in existing irrigation systems, including infrastructure and irrigation technologies, should be implemented to reduce the above losses in order to improve the water usage coefficient. High technologies can be introduced, including sprinkling, leaching and underground watering. However, these technologies are relatively expensive and are considerably used only for high-yield cash crops.

Fourth, upgrading the capacity of available water supply systems and establishing necessary new ones for industry, public and household uses, as well as to meet increasing demands, in both quantity and quality, for drinking water consequent to the rapid development of the region's economy and population rise is a must.

Non-structural measures. Non-structural measures are essential and helpful for supplementing the effectiveness of the structural measures discussed above as well as for economic development plans, in general. These include:

First, plant types, crop schedules and cultivation methods aiming to reduce water demand, promote effective utilisation of available water

and enhance soil reclamation should be identified. Transformation and multiplication plant systems need to be identified using optimisation models developed strategically and based on local conditions (such as cultivation area, water supply, food security and commodity trading). Optimal solutions can be arrived at using the computer model for management science software (CMMS), which is widely used in many countries, especially those with advanced irrigation techniques and methods, such as the Netherlands, Israel, US and Australia.

Second, community management and education to promote participatory irrigation management that focuses on best practices in irrigation and water resource management, lessons learned, training materials and networking through all levels among professionals, researchers, policymakers and farmers should be encouraged. It should also promote knowledge of water conservation techniques by way of guidelines on how to use water effectively and economically.

Third, forest plantation and protection planning should be immediately approved by the government, so that forest land allocation can be done (in accordance with the Land Law and the Law on Forest Protection) to households, cooperatives and organisations for permanent agricultural and forestry production purposes. This will help to prevent land degradation and soil erosion, and improve water regulation within the hydrological cycle to reservoirs and lakes.

Fourth, planning of hydropower dams should be immediately set up in order to find best solutions for the region so that dams built on rivers would not reduce the amount of water flowing to the region, affecting its irrigation systems and reducing water supply.

3.2 Technical measures

From policy and market perspectives. It is also recommended that water policy and planning in Vietnam continue to be strengthened by encouraging work that effectively drives formal water laws, policies and

institutions on the ground. In addition, policies relating to the development of industry and hydropower projects should be amended in favour of reducing risk for water resources.

Because the level of attention paid to water use efficiency is directly proportional to prices charged for water servicing, both the central and local governments of Vietnam should consider promulgating a policy toward servicing water supplies and placing a right and suitable price for water use in the region in order to help attain water use efficiency in the CHV. In fact, many people, especially small farmers, in the region use water for irrigation at no cost, and therefore ignore water-saving measures by way of easy solutions that could effect its efficient use. Putting a price on water (albeit a very small one) would encourage people to rethink the manner in which they use water for economic activities, especially agricultural production, and other purposes.

From the farmer's perspective. A feasible and realistic approach to increasing irrigation water use efficiency in coffee smallholdings in the immediate future is through farmer education. A key recommendation is to establish pilot programmes that train coffee smallholders in irrigation water management. As some joint research projects of the Food and Agriculture Organization of the United Nations (FAO)/ International Atomic Energy Agency (IAEA) Programme[46] have shown that coffee smallholders tend to over-fertilise, a comprehensive coffee smallholder-training programme that includes good irrigation, fertiliser and other farm management practices is recommended. Further, as households in the CHV region have indicated willingness to pay for programmes that increase irrigation water use efficiency in coffee smallholdings, some form of funding arrangement based on direct contributions could be considered.

4. Conclusion

The CHV is Vietnam's part of the CLVDT. The two regions share similarities vis-à-vis nature, culture and societies, and are strategically placed for all countries concerned in terms of politics, economy, society, eco-

environment, defence and security. The regions are prone to natural disasters, such as droughts and floods, among others. Apart from the over and inefficient use of water, inefficient irrigation methods and over-development of hydropower dams across the region's many river systems, drought is considered a critical cause of its water shortage, especially during the winter-spring crops season. Water shortage in the region is severe and badly affects agricultural productivity, especially that of coffee and other industrial crops, people's daily living and other economic activities. Every year, water shortage due to drought damages thousands of hectares of industrial crops, such as coffee, pepper and cacao. This, in turn, causes a decline in household incomes and people's living standards while also affecting the regions' sustainable development.

Increasing irrigation water use efficiency, primarily on the region's agricultural smallholdings, would effect social welfare improvements through water reallocation in the region. These social welfare improvements would come from reducing coffee smallholders' irrigation costs and, more markedly, from increasing the plateau's coffee output by reducing the severity and areal extent of water shortages that currently impose binding production constraints. Sub-catchments fare differently in the region in terms of the size of the welfare wedge generated by regulating what is currently an open access shallow groundwater resource. However, it appears that increasing irrigation water use efficiency on coffee smallholdings would only marginally improve the region's hydrological balance, thus providing only weak support for the argument that increasing water use efficiency on the region's coffee smallholdings would also increase hydro-agro-ecosystem resilience, productivity and stability.

Thus, to improve water use efficiency in the region, recommended solutions range from non-technical measures — structural measures (such as water planning in the basin, and irrigation and drainage systems based on water demand) and non-structural measures (such as identification of plant types, crop schedules, water management and forest plantation) — to technical measures (such as policies and water pricing, institutional reform of water management, and education of

farmers on proper and efficient irrigation techniques to conserve water). All these measures could help save the region's water resources, by using water efficiently and reducing the amount of water needed for irrigation while still yielding high productivity of crops.

Endnotes

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Chapter Six

Fisheries Transitions in Southeast Asia

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Southeast Asia has emerged as a global fish basket, linked to a tremendous increase in aquaculture production and a large offshore fishing fleet. Thailand, Vietnam and Indonesia are in the top five aquaculture exporters globally, with Thailand and the Philippines also being among the top ten canned tuna processing countries. This rapid growth is set against the backdrop of transitional economies in which both traditional, lower-intensity aquaculture and small-scale fishing exist in parallel with intensive, single-species fish farming and offshore fishing. This chapter highlights key fisheries transitions occurring in Southeast Asia, charting the rapid expansion of aquaculture over the past 20 years, the rising importance of fish as an export commodity and the role fish continues to play as a key source of protein throughout the region. While the fisheries sector has generated significant benefits, three specific case studies from Vietnam, Thailand and Cambodia illustrate the range of challenges facing small producers and economic migrants within the sector. The first case study provides an indication of what it means to be a small producer fisher or fish farmer in rural Vietnam; the second case study looks at economic migration, labour abuse and supply chain challenges in the offshore fisheries of Thailand; and, the third case study examines the role of community fisheries in handling large-scale resource extraction activities in the mangrove-estuaries of south-western Cambodia. These case studies illustrate the tensions that exist between sustaining economic growth, supporting fisheries-based livelihoods and ensuring ecological protection. While improved governance of this sector is key, including adherence to existing policies and using regional bodies (such as ASEAN) to coordinate fisheries governance, we first need to understand how rapid changes experienced in Southeast Asia's fisheries sector impact local people, coastal resources and fisher livelihoods. This overview chapter seeks to address this gap.

Keywords: Aquaculture, economic development, fishing, livelihoods, small producers

Biography

Melissa Marschke is an Associate Professor at the School of International Development and Global Studies (SIDGS), University of Ottawa, Ottawa, Canada, where she teaches courses on sustainability, environmental governance and research methods. Melissa's research interests are in the broad area of human-environment relations, with a particular interest in resource governance (i.e., community-based management, adaptive co-management and certification), livelihoods and social-ecological change. Her current research projects include: (i) assessing fisheries-based livelihood transitions in Cambodia and Vietnam; (ii) examining multiple forms of environmental governance in mainland Southeast Asia; and, (iii) investigating urban vulnerability. Her publications include a book: Melissa Marschke, *Life, fish and mangroves: Resource governance in coastal Cambodia* (Ottawa: University of Ottawa Press, 2012), and several articles that have appeared in international journals, such as *Ecology and Society, Global Environmental Change, Environmental Science & Policy, International Journal of the Commons, and Marine Policy*.

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1. Introduction

Southeast Asia's marine-coastal ecosystems are facing rapid transitions due to overfishing, growth in fish farming[1], oil and gas exploration, coastal tourism, and the extensive mining of sand[2]. As populations and economic investment in Southeast Asia's coastal regions have increased, so too have claims over land and biotic resources. Swift economic growth has come at a social and environmental cost — emerging patterns of land and boat ownership have proven inequitable for many coastal dwellers while fish farming poses significant environmental impacts[3], and capture fisheries are in decline[4]. Households along coasts, deltas and lagoons have experienced such rapid social-environmental change in highly uneven ways.[5] Even so, Southeast Asians continue to rely on fish as a primary source of dietary protein and income, more so than in any other region[6], perhaps because nearly 70 per cent of the population lives within 60 km of Southeast Asia's 92,451-km coastline.[7]

Southeast Asia, as a region, has transitioned from small-scale capture fisheries sold domestically or regionally towards a mix of smaller- and larger-scale export-oriented fisheries. This transition has been enabled by the tremendous increase in aquaculture production over the past 20 years.[8] However, tensions exist between sustaining economic growth, supporting the livelihoods of fishers and fish farmers, and ensuring ecological protection. In Vietnam, for example, this tension is evident in national media coverage, national planning documents and the multiple approaches towards certification to ensure all export markets are captured.[9] Economic growth has been prioritised across the region, and challenges with mangrove depletion, water quality and disease in farmed fish are well known. At the regional level, there is little coordination or integration of fisheries policies across Southeast Asia — fisheries governance is proving to be a challenge (as is the case globally).

This chapter provides a brief overview of Southeast Asia's fisheries sector, highlighting the rapid expansion of aquaculture in the past 20 years, the rising importance of fish as an export commodity and

the role fish continues to play as a key source of protein throughout the region. Attention is then paid to three specific case studies from Vietnam, Thailand and Cambodia to examine some of the social and environmental challenges being experienced by poorer fishing households. The first case study provides an overview of what it means to be a small producer fisher or fish farmer in rural Vietnam; the second case study looks at economic migration, labour abuse and supply chain challenges in the offshore fisheries of Thailand; and, the third case study examines the role of community fisheries in managing fisheries resources when sand mining enters into local fishing grounds in the mangrove-estuaries of south-western Cambodia. Each case study is linked to larger regional and global trends, influenced by the opportunities and constraints that emerge within each particular context. While improved governance of this sector is key, we first need to understand how changes in the fisheries sector impact local people, coastal resources and fisher livelihoods. This chapter seeks to provide insights into this gap.

2. Overview of Southeast Asia's Fisheries Sector

Fish stocks in Southeast Asia are considered over-depleted[10], although precise estimates of stock declines are made difficult by the biological complexity of the fishery and the challenges of assessing natural productivity.[11] It may be that fisheries have been fished down to 5 per cent to 30 per cent of their unexploited levels.[12] Fishers themselves also report a decline in catch per unit effort, species size and diversity.[13] Meanwhile, the exploitation ratio (i.e., the amount of fish caught versus not caught on an annual basis) has increased in most Southeast Asian countries.[14] This is likely an example of 'fishing down the food web' since biological production increases roughly tenfold for each decrease in trophic level[15] and explains why, in some cases, official production figures for the region have increased almost sevenfold[16]. A combination of overfishing and the absence of enforcing existing fisheries laws and policies have created a situation where no one is taking responsibility to do anything but harvest the resource.[17] Simultaneously, shrimp, tuna and trash fish (for fish meal) have become key export species.[18]

Alongside fisheries production growth, aquaculture has exploded in the Southeast Asian region (Figure 6.1), with Thailand, Vietnam and Indonesia among the top five aquaculture exporters globally.[19] Farmed shrimp and catfish are key export species. Southeast Asian aquaculture grew at 6 per cent annually throughout the 2000s.[20] The boom crop mentality of some aquaculture species (such as shrimp[21]), combined with a strong dependence on global markets, has exposed coastal communities to a series of risks, including price volatility, environmental degradation (such as poor water quality and disease in fish stocks) and an ever-shifting regulatory environment (e.g., integration into global markets through third-party certification)[22]. Vulnerability, however, varies between production systems. For example, the transformation of shrimp from the small producer level (which continues in Vietnam) to the industrial level (as seen in Thailand) is seen as a positive development by some, in that ecosystems are far less impacted, whereas others view this as a loss of rural livelihoods.[23] What has happened is that a series of species are caught and cultivated, with high-value species being exported and lower value ones, such as crab, mud skippers, milkfish and tilapia, being predominantly traded regionally.[24]

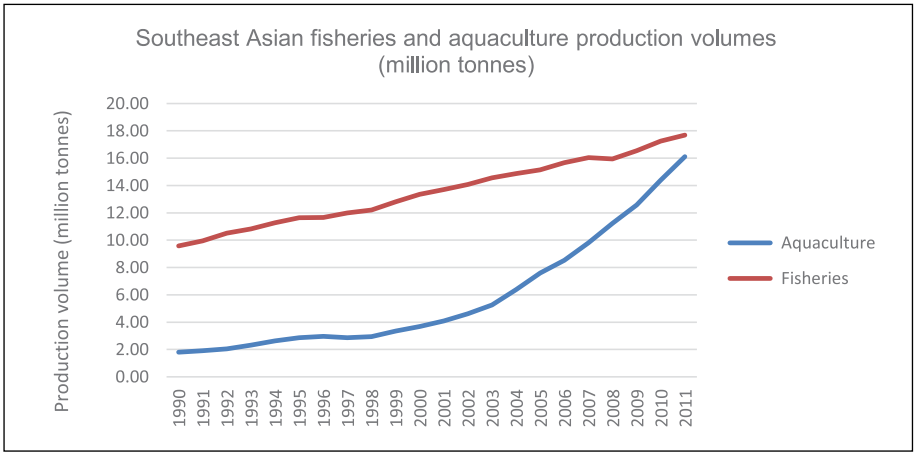

Figure 6.1: Southeast Asian fisheries and aquaculture production volumes (million tonnes), 1990–2011.

Source: FAOSTAT (Rome: Statistics and Information Branch [FIPS], Food and Agriculture Organization of the United Nations [FAO], 2015), accessed October 2015.

Table 6.1 provides an overview of the top three fisheries imports and exports per Southeast Asian country, illustrating the sheer volumes of fish being produced for export markets in countries, such as Thailand, Vietnam and Indonesia, compared with the rest of the region. By volume, tuna, shrimp, various forms of marine fish (frozen or fresh) and catfish are significant export species. A careful analysis of Table 6.1 illustrates how diverse each country's fishing sector is, with some countries relying on frozen fish for export and others relying on fresh fish. Net fisheries exports have significantly increased since the 1990s, with Thailand and Vietnam each earning around USD 4 billion in net fisheries exports in 2009.[25] In Vietnam, for instance, fisheries (capture fish and farmed fish) contribute to over 10 per cent of national gross domestic product (GDP) and nearly 50 per cent of agricultural GDP.[26]

Table 6.1: Top three fish imports and exports by volume (tonnes) across Southeast Asia

Country	**Top three imports** (tonnes)			**Top three exports** (tonnes)		
	1	2	3	1	2	3
Brunei	Fish meat, frozen (406)	Sardines, sardinellas, brisling or sprats (379)	Trout and char live (366)	Shrimp and prawns, frozen* (21)	Shrimp and prawns, peeled* (13)	Shrimp and prawns, not cooked* (10)
Cambodia	Freshwater fish, frozen (2,967)	Mackerel, prepared or preserved* (900)	Ornamental fish (352)	Marine fish* (15,192)	Freshwater fish, frozen* (6,696)	Freshwater fish, fresh or chilled* (4,517)
East Timor	Shark fins, dried (112)	Miscellaneous dried fish (96)	Fish, minced (94)	Rock lobster* (20)	Other seaweeds and aquatic plants* (15)	Shrimp and prawns, prepared or preserved* (9)
Indonesia	Mackerel, frozen (90,052)	Fish meal (67,208)	Marine fish, frozen (16,010)	Marine fish, frozen (121,580)	Shrimp and prawns, frozen (99,857)	Other seaweed and aquatic plants (94,003)
Laos	Fish meal (2,279)	Tuna, frozen (883)	Mackerel prepared or preserved, not minced (399)	Fish, fresh or chilled* (1)	Rock lobster and other sea crawfish (1)	Fish, frozen* (1)
Myanmar	Fish, prepared or preserved, not minced (864)	Sardines, sardinellas, brisling or sprats* (630)	Shrimp paste* (478)	Shrimp and prawns, frozen* (18,382)	Fish meal (13,256)	Crabs, not frozen* (12,587)
Malaysia	Fish meal (14,584)	Fish fillets, frozen (14,123)	Pilchards (11,446)	Fish, frozen (11,162)	Shrimp and prawns, fresh or chilled (11,145)	Fish, minced, prepared, preserved (6,766)

The Philippines	Skipjack tuna* (42,805)	Cephalopods (34,347)	Fish meal (23,368)	Tuna, prepared or preserved* (83,847)	Yellowfin tuna* (15,907)	Other seaweeds and aquatic plants (10,734)
Singapore	Fish, minced* (20,724)	Fish fillets* (19,289)	Fish waste (12,583)	Fish waste (12,683)	Marine fish (5,366)	Fish, minced (4,632)
Thailand	Tuna, prepared or preserved (494,322)	Shrimp and prawns (191,127)	Shrimp and prawns, prepared, preserved (147,144)	Skipjack tuna (668,515)	Marine fish (199,296)	Marine fish, fresh or chilled (153,969)
Vietnam	Fish meal* (118,420)	Fish, frozen* (24,045)	Tuna (16,208)	Catfish fillets, frozen (247,300)	Shrimp and prawns, frozen (192,188)	Cuttlefish and squid (54,311)

* Fish species falls within the top three imports or exports by value (USD).

Source: FAOSTAT (Rome: Statistics and Information Branch [FIPS], Food and Agriculture Organization of the United Nations [FAO], 2015), accessed October 2015.

Opportunity for fish exports are linked to biophysical spaces — freshwater fish from Cambodia, and marine fish from the Philippines and other countries with significant access to coastal waters. The Philippines and Thailand, for example, have invested significantly in their offshore fleets. While some countries can freeze their fish supply, pre-export, others have the capacity for value-added processing. This links to fish imports, particularly in transforming frozen aquatic products into canned tuna, shrimp or crab. An analysis of top imports also highlights the demand for fishmeal in the Southeast Asian region, particularly in Vietnam and the Philippines. Fishmeal consists of small fish (trash or 'forage' fish) that are dried and ground for use as a fertiliser or animal feed. Fishmeal is also used to feed farmed fish, including shrimp, as will be highlighted in one of the three case studies later.

From a food security perspective, Southeast Asia has a higher per capita consumption rate of fish than any other region globally. For example, per capita fish consumption hovers around 30 kg per year in Thailand whereas, for Malaysia and the Philippines, the figure is around 50 kg per capita annually.[27]

Complexity across the fisheries sector will increase, as coastal ecosystems face warming temperatures, rising sea levels, increasing acidification of marine environments and changing precipitation patterns, all of which will modify the structure and productivity of marine ecosystems.[28] Climate change will have serious consequences for fishers and fish farmers, particularly in terms of what is cultivated and harvested.[29] Perhaps equally important are the influences of globalisation that are likely to further compound social and environmental changes through changing food production, intensification of fish farming, trade and rising food prices. This is why it is important to understand local realities and consider how to better govern the fisheries sector at this point in time, since governing rapid change can only happen if strong mechanisms are already in place.

3. Fisheries Transitions: Case Studies

The following section grounds this overview of fisheries transitions in Southeast Asia by featuring three case studies that focus on small producer fishers, fish farmers and labourers. Small producers refer to fishers, fish farmers and labourers that operate at an individual or household level, rather than as a larger corporate identity, and who have less financial investment than industrial-scale fishing or fish farming. The three case studies in this chapter are not comparative; rather each offers insights into some of the challenges facing poorer fishing-focused households. Combined, these three case studies illustrate how dynamic the sector is and hint at why fisheries are so difficult to govern properly. Each case study is divided into two sections, starting with a brief overview of the fisheries and followed by a specific case example.

The first case study provides an analysis of the socioeconomic characteristics associated with a range of fisheries-related livelihoods

found in coastal villages across Vietnam, and illustrates how some small producers — both fishers and fish farmers — really struggle to make ends meet. The second case study, which focuses on economic migration and human trafficking within Thailand's offshore fisheries sector, highlights serious labour issues and governance challenges in the sector and beyond. The third case study, which turns to small producers in Cambodia who have been actively involved in community organising of their fisheries since the year 2000, elucidates how large-scale extraction activities (sand mining, in this case), linked to broader development trends in the Southeast Asian region, can serve to undermine forms of local fisheries management and result in serious social-ecological consequences.

3.1 Case study 1: Understanding what it means to be a small producer in the fisheries sector

Vietnam's fisheries sector. Vietnamese fisheries have experienced rapid growth — between 1990 and 2011, fishing grew by 5.7 per cent annually while aquaculture grew annually by 14.7 per cent.[30] Since 2007, farmed fish production has surpassed fishing effort (Figure 6.2), and Vietnam is at the forefront of an aquarian transition — from fishing to fish farming and from rice farming to fish farming. Aquaculture is dominated by two farmed species — penaeid shrimp (Penaeus monodon and Penaeus vannamei) and pangasius catfish (Pangasianodon hypophthalmus), with frozen catfish fillets being Vietnam's top export (247,300 tonnes) closely followed by frozen shrimp and prawns (192,188 tonnes).[31] Farmed fish continues to be produced at a household level, although consolidation in some sectors has occurred. For instance, 95 per cent of shrimp farming areas continue to be occupied by small producer farmers contributing two-thirds of total Vietnamese shrimp production.[32] A significant portion of catfish production also remains at the household level although, even in cases where farm size is small, catfish production is not something in which poor households are engaged and cannot be considered small scale in terms of a 'quasi-peasant activity'.[33]

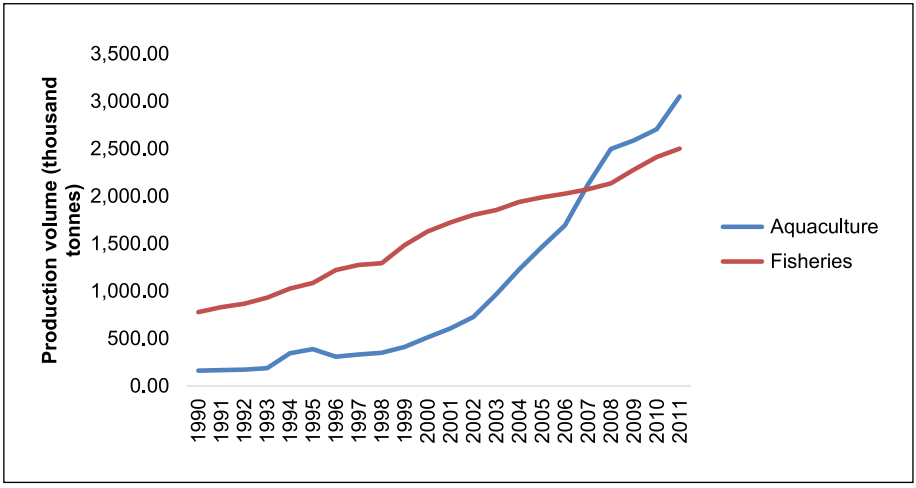

Figure 6.2: Vietnam's fisheries and aquaculture production volumes (thousand tonnes), 1990–2011.

Source: FAOSTAT (Rome: Statistics and Information Branch [FIPS], Food and Agriculture Organization of the United Nations [FAO], 2015), accessed October 2015.

Vietnam's continuum of fishers and fish farmers.[34] A range of fishing and fish farming practices are found in Vietnam, from small producers to agri-business corporations. Even so, much of Vietnam's fisheries production remains at a household level, which is why it is worth paying attention to what it means to be a small producer in this context. Fishers may operate boats with low motor capacity in mangrove estuaries, rivers or along coast lines, or rely on sophisticated sonar equipment to track schools of fish in offshore waters.[35] Fish farmers also operate across a continuum of production intensities (low, moderate or highly intensive), in what Belton et al. and others[36] characterise as quasi-peasant, quasi-capitalist and capitalist modes of production. Fish is produced and caught for both regional and export markets.[37] Vietnam's transition from fishing into fish farming has been fuelled by global interest in cheap fish, particularly shrimp, with farmers converting rice fields into fish farms throughout the Mekong Delta and within lagoon-scapes.[38]

Coastal households engage in multiple livelihood activities. Table 6.2 summarises the status of 599 households practising a diversity of fishing and fish farming activities across three districts in Vietnam (two districts located in the Mekong Delta and one district located in north-central Vietnam). Respondents were asked for total annual income, broken down by five livelihood categories — fishing, aquaculture, agriculture, wage and salary employment, and self-employment — of which fishing and aquaculture were further sub-categorised.[39] Table 6.2 illustrates the range of fisheries-related activities coastal households may be involved in, from near-shore fishing and offshore fishing to extensive fish farming or intensive shrimp farming. Even in households where fishing or fishing farming was not the largest income earner, most households continued to practise some form of fishing or fish farming as a complimentary livelihood to other income-generating activities — these households were categorised as 'other', since they earned more income from non-fisheries based livelihoods. Fishers target wild shrimp in near-shore fishing areas and squid further offshore. For fish farmers, black tiger shrimp are the most common species cultivated, with 70 per cent of households across the entire sample cultivating it.

Table 6.2: Selected characteristics across fishing and fish farming production intensities in Vietnam (n = 599).

Variable	Fishing		Fish farming		Other*
	Near shore	Offshore	Extensive	Intensive	
Primary fish activity	127	67	210	46	149
Main species targeted	Wild shrimp	Squid	Black tiger shrimp	Black tiger shrimp	Black tiger shrimp
Average assets**	5	7.5	5.9	7.5	5.9
Average land (hectare)	0.56	0.24	2.13	2.72	1.84
Mean household per capita income (VND million)	93.9	645.4	65.1	146.6	86.6
Mean proportion of household income by primary	0.74	0.91	0.76	0.89	0.70

* Category 'other' refers to households whose primary income stems from farming, wage or self-employment. Within this category, 83 per cent of households also obtained income from fish farming (i.e., it was not their highest source of income in 2012, but was an important contributor to a households' livelihood portfolio). In contrast, only 10 per cent of households had fishing income.
** Assets included car, motorbike, motorboat, rowboat, cell phone, television, stereo, machine pump, computer, fridge, freezer, air conditioner, washer, electric cooker, gas cooker, water heater and microwave.

Incomes across primary livelihood activities varied greatly, from an annual household income of VND 65 million (or, approximately USD 3,142) to VND 645 million (approximately USD 31,175), or USD 655–6,495 per capita per year, with an average of 4.8 people living in each household. Near-shore fishers, extensive fish farmers and households in the other category all were well under Vietnam's average per capita income, which in 2012 was USD 1,755, with USD 1,579.4 per capita per year for rural dwellers.[40] What these numbers suggest is how many fishers and fish farmers struggle to make a decent livelihood from fishing or fish farming, even as the link these activities have with non-fisheries activities has increased.[41] Options for coastal households are limited, and migration of household members into Mekong Delta cities is a real phenomena.

Table 6.2 also lists average assets across primary groups, ranging from five assets for near-shore fishers to 7.5 assets for offshore and intensive fish farmers. Fishers, in general, have little access to land compared with extensive or intensive fish farmers. Access to land enables certain types of livelihood options — fish farming in the Mekong Delta and, in some cases, agricultural farming in north-central Vietnam — which may serve as a base to then pursue other livelihood options (note that 'other' households by primary held 1.84 ha of land on average). This said, the mean proportion of household income derived from a primary activity suggests that near-shore fishers (0.74) supplement their income with other livelihood activities to a far greater extent than offshore fishing households who rely on their fishing activities (0.91). This dynamic is also seen between extensive and intensive fish farmers — extensive fish

farmers also supplement their income with other livelihood activities to a far greater extent than intensive fish farmers (0.76 and 0.89, respectively). Households in the 'other' category, practising a mix of fishing and non-fishing livelihoods, rely on a diverse range of livelihood activities (0.70).

On the other end of the continuum, intensive fish farmers and, particularly, offshore fishers are economically well off (in a good year, if a crop doesn't fail, and if there are no major storms out at sea). Intensive fish farmers earn over twice that of extensive fish farmers, and have a high mean proportion of income, suggesting that they mainly rely on fish farming for their income. Offshore fishers (those owning boats) earn significantly larger amounts of income compared with any other group and, while they own little land, they own more assets than any other group. Offshore fishing requires significant capital and labour to run boats, and was something specialised seen in one commune within our sample. However, most fishing households cannot access this livelihood ever; even intensive fish farming is not something that many households can move into.

What initial analysis from this survey data suggests is that small producers — fishers and fish farmers — do struggle. Low annual incomes, limited horse power, older fishing gear and a lack of capital to invest in better fish farming techniques speaks of the high levels of uncertainty that these households are subjected to. Some of these households are really struggling, even as they contribute to Vietnam's overall seafood boom. Fisheries policy needs to account for this portion of the population working in the fisheries sector — working in such difficult conditions is not sustainable for these households. While an exodus out of the fisheries sector may be part of larger agrarian change, people continue to depend

on this sector for at least the short-to-medium terms. Vietnam's seafood boom does not appear to be benefiting these households, and far greater support is necessary.

3.2 Case study 2: Economic migration, poor labour conditions and supply chain ignorance

Thailand's fisheries sector. Thailand's seafood sector is more consolidated than Vietnam's — whereas a significant amount of production remains at the household level in Vietnam, this is not the case in Thailand, given that Thailand developed shrimp exports at an earlier point than Vietnam. Shrimp is a key export for Thailand, with 95 per cent of all shrimp caught being exported. By volume, Skipjack tuna is Thailand's top export species (668,515 tonnes) while marine fish (199,296 tonnes) and marine fish (fresh and chilled; 153,969 tonnes) are the second and third ones, respectively.[42] The tuna fishery is large scale, with a significant portion of Thailand's offshore fleet targeting tuna (Table 6.1). Coastal households also engage in small-scale fisheries, generally within 3 km of the shore. Figure 6.3 shows Thailand's aquaculture and fish production since 1990. As fisheries production declined since its peak in the mid-1990s, farmed fish grew (the dip for aquaculture production from 2010 may be linked to initial signs of early mortality syndrome (EMS), which has effected the sector badly in recent years). Thailand has a national certification standard, Thai Quality Shrimp, as one form of governance for its supply chain and to ensure food safety, and several national departments are responsible for evaluating compliance with the standard.[43] Thailand has updated or passed significant fisheries legislation in recent months for reasons that are discussed in the preceding sections.

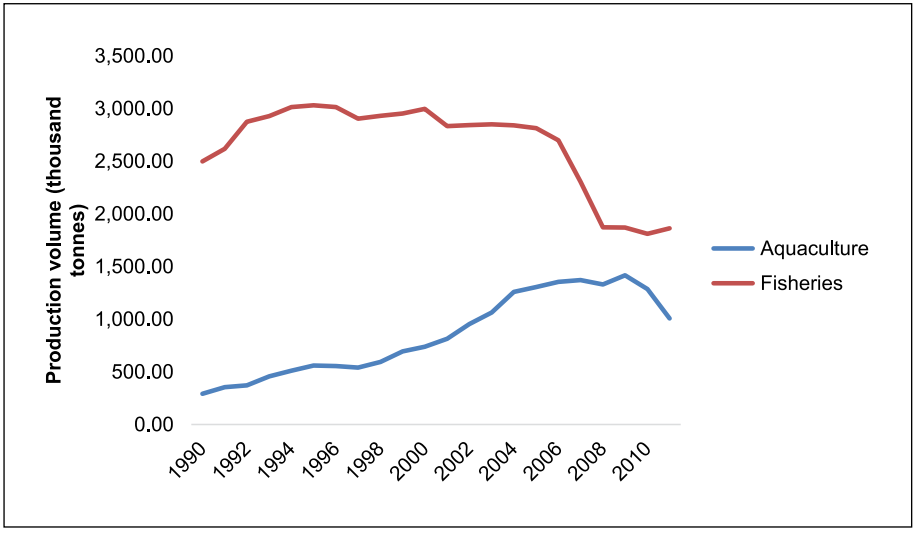

Figure 6.3: Thailand's fisheries and aquaculture production volumes (thousand tonnes), 1990–2011.

Source: FAOSTAT (Rome: Statistics and Information Branch [FIPS], Food and Agriculture Organization of the United Nations [FAO], 2015), accessed October 2015.

Thailand's fishing industry exposed.[44] The Thai government estimates that around 300,000 people work in Thailand's fishing industry, 90 per cent of who are migrants[45] from Myanmar, Cambodia and Laos.[46] Migrant workers fill chronic labour shortages, with an estimated 50 per cent of migrants working on 'ghost' or illegal vessels not registered or regulated within the industry.[47] In some cases, migrants endure long shifts (up to 20 hours at a time), live on one meal a day consisting of rice and a little fish, experience physical abuse and may be out at sea for months or years at a time. There have also been reports of witnessed executions of fellow workers as a method of forcing compliance.[48,49] Such labour abuse is difficult to tease out. Even in cases where migrants and vessels are registered — and there has been a large effort to do so in recent months — unsafe working conditions (such as long working hours and adequate wages) are an issue.

In 2014, an investigation by a UK newspaper, *The Guardian*, meticulously traced one shrimp supply chain — offshore fishing boats catching trash fish

(among other species) that were offloaded on shore, turned into fishmeal at processing factories and then bought by farms as shrimp feed, with the farmed shrimp then being exported internationally. Reporters linked trash fish catch, turned into fishmeal for farmed shrimp, with offshore fishing vessels relying on trafficked labour. The Thai conglomerate, Charoen Pokphand (CP), which accounts for 10 per cent of Thailand's shrimp exports to the European Union (EU) and North America, bought fishmeal linked to trafficked labour. Major retailers also purchase this shrimp. When this story broke, some retailers (such as Whole Foods and Carrefour) distanced themselves from CP by withdrawing from all CP contracts.[50] CP immediately responded, promising better audits of its supply chain (CP Foods, Australia), denouncing such deplorable working conditions and initiating a round of meetings in Bangkok with major retailers (including Costco US, Tesco and others) to discuss a global benchmark strategy for sustainable feed production and a strategy to halt forced labour in the seafood supply chain.[51]

The Thai government is facing strong criticism, and was immediately downgraded to tier 3 status in the US State Department's 'Trafficking in persons report' in 2014.[52] The Thai government is also facing serious pressure from the EU to improve its fishing practices, with the EU threatening to ban all exports from Thailand if fisheries governance does not improve. In response, the Fisheries Act is being amended, a series of registration centres for offshore fishing vessels has been established and there is an attempt to better manage the situation of economic migrants. While these are important steps, enforcing existing and newly approved policy will be key, and it will take more than the Thai government to get a handle on labour abuse occurring in offshore fishing fleets.

Economic migration to fill labour shortages in the fisheries sector — on offshore boats and in processing plants — is not new. Migration routes shift and, while two decades ago labour shortages were filled by workers from north-eastern Thailand, this has now been replaced by regional migrants. Brief discussions in Songkla, southern Thailand, hint at the complexity of the issue. Cambodians do crew many boats here, and it is hard to assess working conditions although, in watching anchovy

being offloaded, it was clear how physically intensive this type of work is. Crews mentioned that they went out at sea for five days at a time. Meanwhile, boat owners registering migrant workers commented that they needed to visit seven government offices if they were to officially register migrants. This is a complex layered system that will take time and significant effort to change. The drivers of economic migration and cheap seafood need to be carefully examined — there is a role for non-governmental organisations (NGOs), national governments, regional coordinating bodies (such as ASEAN) and the private sector to play in addressing labour challenges and regional poverty. Consumers may need to pay more for their seafood to help ensure that adequate working conditions and proper wages are paid throughout the supply chain.

3.3 Case study 3: Community fisheries in the face of large-scale extraction activities

Cambodia's fisheries sector. In Cambodia, the fisheries sector is also important from the poverty alleviation and economic development perspectives. Fisheries contributes to around 7 per cent of national GDP, and the sector employs 10.5 per cent of Cambodians on a full-time basis and an additional 34 per cent of people on part-time basis.[53] Cambodians rely on a significant amount of fish products as their primary source of protein (consuming, on average, 52 kg per year as compared with other animal proteins, which are consumed at levels below 10 kg per year).[54] Cambodia has lower levels of adaptive capacity to climate change than other countries in the region[55], in large part a product of high aid dependency (9 per cent of GDP), limited state capacity, high levels of poverty and a dependence on natural resources for many rural livelihoods. Therefore, a collapse in fish stocks, from overfishing or climate variation, will be felt far beyond the local level in the country.

As Figure 6.4 illustrates, fisheries production in Cambodia is far higher than aquaculture production at this point in time. While the volume of fish harvested is not the same as Thailand or Vietnam, this is a sector employing mainly small producers, and a large portion of supply remains, in Cambodia, for domestic consumption. Cage culture, as a form of fish

grow-out, has long been practised in the Tonle Sap and, to a lesser extent, in coastal areas, being stocked at low densities and acting as a 'bank in the sea'. Only in recent years has aquaculture begun to intensify although production levels remain relatively low due to stocking, infrastructure and disease issues. Cambodia's key exports come mainly from fishing (marine fish, 15,192 tonnes; frozen freshwater fish, 6,696 tonnes; fresh or chilled freshwater fish, 4,517 tonnes).[56]

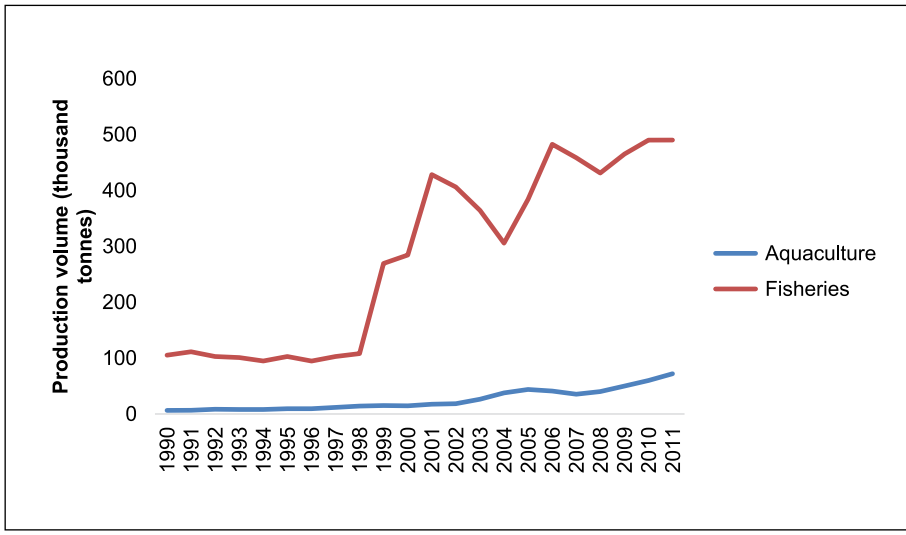

Figure 6.4: Cambodia's total fisheries and aquaculture production volumes (thousand tonnes), 1990–2011.

Source: FAOSTAT (Rome: Statistics and Information Branch [FIPS], Food and Agriculture Organization of the United Nations [FAO], 2015), accessed October 2015.

Dredging for sand in a coastal protected area.[57] The third case study focuses on resource extraction, community-based institutions and protected areas governance. Although local institutions have been highly successful in implementing a series of resource management and fisheries-related activities in one coastal protected area (including mangrove replanting, environmental education, ecotourism and halting the use of some destructive fishing gear)[58], they struggle to handle large-scale challenges, such as the emergence of sand mining activities, thought to affect fish stocks negatively.[59] This sand mining example

illustrates how regional trade can impact livelihoods in relatively remote fishing villages, and how locally focused resource governance regimes are not adequately equipped to handle broader political-economy challenges — sand mining is part of a larger trend of entrepreneurs being able to exploit natural resources for economic and political use (vis-à-vis timber, land concessions and mining).

Sand mining is also linked to the construction boom found throughout Southeast Asia, including within Cambodia. Sand is dredged throughout the country — in the Mekong River and its tributaries, and in coastal areas — for use within Cambodia and for export throughout Asia (including to India and Singapore). What makes sand mining particularly challenging in south-western Cambodia, the site of our study, is that this area has a legacy of strong community-based management. The area is designated for protection nationally (as a protected area, Peam Krasaop Wildlife Sanctuary) and internationally (as a Ramsar Site). However, sand mining has taken place in and around this coastal protected area since late 2007. Chinese military staff the boats, large quantities of sand are extracted and coastal sand mining is allowed, even as much of the sand mining appears to be taking place in the border areas of a protected area. The sand is being sold to Singapore for construction purposes (sand mining only began in south-western Cambodia after Indonesia banned sand exports in 1997).[60]

While the longer-term impacts of sand mining are less clear, its short-term impacts are more obvious. Fish habitat is affected (dredging deepens shallow channels, impacting fish and other aquatic habitat in the process), fish migration routes are disturbed and the water is said to become more turbid. Boats have been dredging near the edge of the mangroves, partially damaging some trees and ripping out others. This is a source of frustration for villagers since they have been involved in replanting over 800 hectares of mangroves in this area over the past decade. Several minor landslides have also reportedly taken place. Fishers respond to these impacts in various ways, including by fishing closer to the village or by fishing far away from the sand mining. For

those who cannot afford larger boats to go further offshore, this can come at a considerable risk in terms of handling unanticipated storms. In one village of 300 households, over 20 households had left the village to pursue non-fishing livelihood activities.[61]

While villagers have been coping with sand mining for years, this changed in the spring of 2014 when sand mining activities began operating within 500 m of several villages. These operations were well within the boundary of the protected area and, in addition to the noise of constant dredging, villagers were concerned about fishing grounds in and around the villages. Villagers also felt that the company was trying to dredge up the final bits of sand from this area, having mined up and down and around the streams and coasts of south-western Cambodia for the past seven years. Armed with maps and paper documents showing signatures from relevant authorities (including at the national level), the village management committee and local park rangers showed the company their signed papers. Although the sand mining did stop for a few days, according to sources familiar with this case, the company claimed that they had appropriate license for such operations and activities resumed soon thereafter. While it is unclear if a government official has signed the company papers, someone within the governance system is supporting these activities since the sand mining is in clear contravention of the Community-based Protected Areas Management Sub-Decree[62].

Post-script, June 2015. Within a few weeks of posting some of this material as a blog post, in June 2014, sand mining operations moved away from the villages to the edge of Peam Krasaop Wlidlife Sanctuary. It is not clear what prompted such actions. While the impacts of sand mining have simply been displaced elsewhere, this nonetheless has provided relief to the villagers. Within a few months of the sand mining moving, households spoke of the return of one crab species into the mangrove-estuary areas near their villages. While this case may only impact people in a handful of villages, it speaks of real resource governance challenges. Moreover, this illustrates how coastal villages require more support than just for fisheries governance.

4. Discussion and Conclusion

The three case studies presented here hint at a range of challenges confronting small producers throughout Southeast Asia's fisheries sector. Global demand for cheap, plentiful seafood fuels poor working conditions, both at the farm level, as seen in the Vietnamese instance, and at the offshore fleet level, as seen in the Thai instance. Meanwhile, other industries vie for coastal resources, which can greatly impact fisher livelihoods, as seen in the case of sand dredging in coastal Cambodia. Although fisheries exports contribute significantly to the GDP of many Southeast Asian countries, with some households benefiting greatly from involvement in this sector, labour abuses, highly contested forms of resource extraction and grinding poverty for a section of fishing households continue.

Southeast Asia is at the forefront of the global trend of meeting seafood demands through farmed fish by 2050[63] — consolidating fish farms or industrialising fishing activities may make less sense than focusing on getting the conditions right to improve access to capital and to mitigate against uncertainty and risk throughout the fisheries sector. For example, several recent studies[64] have argued that forms of extensive or small producer fish farming can be more efficient and less polluting than intensive fish farming, and caution against the mistakes of the green revolution, whereby higher rates of food were produced at the expense of local livelihoods and the environment. The fisheries and aquaculture sector will continue to play a major role in contributing to nutritional security and economic growth in Southeast Asia, and remain a major employer[65] at least for the short-to-medium terms and, for farmed fish, likely the longer term.

Governance in the fisheries sector is not easy, and will require greater adherence to and enforcement of existing laws. NGO and media scrutiny, as shown in the Thai instance, can play a pivotal role in galvanising action across multiple scales. All three case studies highlighted flawed governance processes — Thailand's supply chain has processes in place to enable audits; Cambodia's community fisheries policy bans sand

mining within protected areas; and, forms of market-based governance (certification) and community-based governance (co-management) exist in Vietnam with the idea that such processes enhance small producer livelihoods. There is a need for policy uptake vis-à-vis existing rules and regulations. Policies need to be responsive to the influence of markets in shaping livelihood choices in fishing and fish farming. Southeast Asia is a global fish basket, and this is something worth nurturing, sustaining and governing.

There is a role for ASEAN, as a regional institution, to straddle governance across countries and to help deal with issues such as cross-border trade, non-compliance and economic migration. ASEAN could be at the forefront of coordinating an integrated fisheries system perspective approach, moving institutions beyond thinking of fishing or fish farming as separate, acknowledging labour challenges within supply chains and spanning multiple levels. Fish is a regional commodity that is shared globally. The EU is placing real pressure to improve fisheries governance in Thailand — this is an opportunity to spearhead fisheries reform at a regional level since fisheries governance challenges extend beyond Thailand. Governments need to recognise that fish are not an endless resource to be depleted, and that this sector requires nurturing if it is to sustain ecosystems, livelihoods and economic development.

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Chapter Seven

Sustainable Growth in Indonesian Marine Protected Areas: Alternative Livelihoods Development as Marine Resource Management Strategy

Gilles Maillet

Independent researcher

Marine protected areas have become an important tool for marine resource management in Indonesia, with strong support from the scientific community and the government alike. A common policy found in marine protected areas is the promotion of marine-based alternative livelihoods as a means to steer fishermen away from marine resource exploitation towards other livelihood activities, such as ecotourism and mariculture, that are supposed to be more sustainable. Although very appealing, this chapter shows how this strategy is far from straightforward. In the three marine protected areas studied herein, the successful implementation of alternative livelihoods strategies varied greatly depending on the local specificities of each site. Ecotourism development faces several challenges, such as unimplemented regulatory frameworks, lack of willingness from local communities to enter the industry and a general lack in local capacity for its sustainable development. Mariculture faced its own challenges, such as pervasive disease and limited scalability, which place the viability of the industry as an alternative livelihood into question. However, despite the many issues facing alternative livelihoods development, they can still serve an important role in sustainable growth as long as proper supporting mechanisms are put in place to aid their growth. It is hoped that a better understanding of the contributing or hindering factors to alternative livelihoods implementation will lead to better informed policy in regard to sustainable growth for coastal regions not only in Indonesia but also for other coastal member states of ASEAN.

Keywords: Alternative livelihoods, aquaculture, ecotourism, Indonesia, marine protected areas

Biography

Gilles Maillet is from Saint Mary's Bay, a small Acadian fishing community in Southwest Nova Scotia, Canada. He obtained a Bachelor of Science degree from Université Sainte-Anne, Canada, and a Master's degree in Geography from the University of Montréal, Canada. He was a researcher at the Canada Chair of Asian Research and has contributed to such projects as the Challenges of the Agrarian Transition in Southeast Asia (ChATSEA).

Gilles' research interests focus on the themes of coastal livelihoods and marine resource management in Southeast Asia, with particular emphasis on Indonesia. His Master's research sought to analyse the socioeconomic impacts of marine protected areas on local traditional fishing communities in Indonesia, as well as the environmental subjectivities of local actors living within these highly regulated spaces.

As part of the ASEAN-Canada Junior Research Fellowship, Gilles' project 'Sustainable growth in Indonesian marine protected areas: A study of the contributing and impeding factors to alternative livelihoods implementation as a coastal resource management strategy' will analyse the socioeconomic and geographical specificities of several marine protected areas that either hinder or contribute to the development of alternative livelihoods strategies commonly promoted within Indonesian marine protected areas.

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1. Introduction

The sustainability of global fisheries has long been a concern for prominent marine scientists, with past studies indicating that many of the world's fish stocks are at risk of collapse due to overfishing and other threats.[1] Unfortunately, the situation has not gotten any better, with the Food and Agriculture Organization of the United Nations (FAO) estimating, in 2011, that 29 per cent of the world's fish stocks were being fished at biologically unsustainable levels, with a further 61 per cent being fully fished.[2] This intense fishing pressure is caused not only by industrialised large-scale fisheries but also small-scaled ones, such as those conducted in tropical coral reef ecosystems. The vast majority of the planet's small-scale fishermen are located in biodiversity hotspots, such as Southeast Asia, where the world's most extensive and diverse coral reef ecosystems are found; home to approximately 480 species of coral and 1,650 species of fish.[3]

As policymakers become aware of the deterioration of marine resources and fisheries, efforts to mitigate the negative impacts of marine resource exploitation are being made with the introduction of different types of coastal and marine management strategies. Marine protected areas (MPAs) have become one of the strongest contenders in this field and have gained support from the scientific community and governments alike. Several studies have confirmed the theorised benefits of MPAs by showing that they help promote increases in density, biomass, individual size and diversity of marine species located within their

boundaries[4] and can help rebuild depleted fisheries stocks[5]. Many Southeast Asian countries have implemented MPAs in the hope of protecting their dwindling marine resources, with Indonesia being one of the most active in this regard. MPAs not only offer a promising strategy for mitigating fishing pressure and allowing marine ecosystems to recover from past overexploitation but also include efforts to better understand the socioeconomic conditions of their respective regions in order to promote sustainable economic growth.

A common policy found in MPAs is the promotion of marine-based alternative livelihoods as a means to steer fishermen away from the exploitation of marine resources towards other livelihood activities that are more sustainable. The two most commonly promoted livelihood activities in Indonesian MPAs are mariculture (seaweed farming and fish farming) and ecotourism. These two alternative livelihoods are thought to have strong potential to boost the local economies of fishing villages and be the best suited for successful implementation within these coastal regions. Alternative livelihoods have been shown by some to play an important role in reducing pressure on coastal resources while mitigating the negative impacts of new MPA policies, such as closed areas, on the incomes of resource users.[6] Furthermore, alternative livelihoods have, in some cases, been shown to provide greater income as well as diversified livelihood strategies for households in coastal fishing communities.[7] These enable households to rely on several sources of income, making them more resilient to shocks and stresses, such as periods of low fish catches.[8]

Most management plans for Indonesian MPAs adopt the notion that the promotion of alternative livelihoods will allow for the sustainable growth of the local economy. In this context, such livelihoods should therefore provide alternative sources of income for local communities that are derived from activities that are sustainable in nature. Sustainable livelihoods are commonly defined as the following:

> [A] livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living.

> A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base.[9]

The successful implementation of alternative livelihoods strategies varies greatly between regions, and much work is still required to uncover the causes behind this variance. The literature on MPAs is vast; however, as Dalton explains, most of the research done thus far on the topic has been 'heavily weighted with perspectives grounded in ecological theory'[10]. Dalton argues that research must also come from the social sciences camp to better inform marine policy decision-making. In a rare study on the impacts of MPAs on fishing communities, Mascia, Claus and Naidoo reiterate Dalton's statement by asserting that 'further research must better document and explain variation in the positive and negative social impacts of MPAs'[11] in order to better inform policymaking. Understanding exactly why some areas are more successful than others when attempting to boost economic growth through alternative livelihoods is crucial for the development of better informed policies. With stronger policymaking, solutions might be found for successfully implementing alternative livelihoods in areas where they have not yet taken hold.

The objectives of this research project were to uncover the principal factors that affect either the success or failure of alternative livelihoods strategies within several Indonesian MPAs. It examines how the socioeconomic, environmental and cultural specificities of each region have either aided or hindered the growth of new industries and economic opportunities promoted by their respective MPAs. Alternative livelihoods are a common coastal management strategy used to promote sustainable economic growth in Indonesian MPAs. A better understanding of the contributing or hindering factors to alternative livelihoods implementation will lead to better informed policy in regard to sustainable growth for coastal regions not only in Indonesia but also for other coastal member states of ASEAN.

2. Study Sites

The study sites for this research were selected based on two main criteria. Firstly, the feasibility of each site was assessed by examining a few main factors, such as the level of site isolation, expected on-site support and stability of the local government. Secondly, and most importantly, each site needed to have a relatively robust management structure with on-site management as well as a formalised management plan that included alternative livelihoods development as one of its management objectives. Three national parks were analysed in this study and each of them is categorised by the International Union for Conservation of Nature (IUCN) as a category II nature conservation area and as such are each required to develop a 25-year master plan that spells out the future direction for their management. Although each master plan is naturally adapted to the local specificities of each park, there are several shared common themes found in each document: (i) protection and conservation of natural resources; (ii) enhanced management of marine resource exploitation; and, most importantly, (iii) community development that relies on the development of alternative livelihoods. This last theme of alternative livelihoods development was a key criterion when selecting study sites. The management plans for each park focus on the idea that alternative livelihoods can provide economic incentives for fishers to transition away from fishing into non-extractive livelihoods, which will, in theory, lead to a reduction in fishing pressure that will, in turn, aid the rehabilitation of marine resources.

Since the passing of the Autonomy Law in 1999[12], the legal frameworks of Indonesian marine national parks have more or less been in flux, as jurisdiction over marine resource management has slowly moved away from the central government toward provincial and regional governments[13]. These new developments have enabled marine national parks to better improve their management through decentralised and co-managerial processes. As will be seen in the following sections, the three marine national parks selected for this study all adhere to this relatively new decentralised approach to marine resource management.

2.1 Wakatobi National Park

Located in the province of Southeast Sulawesi, Wakatobi National Park (WNP) was first established in 1996[14] and covers a vast maritime and land area of 13,900 km^2. A relatively large population of about 100,000 people inhabits its four major islands of **Wa**ngi-Wangi, **Ka**ledupa, **To**mia and **Bi**nongko (Wakatobi). The park sits squarely within what is known as the Coral Triangle, a region characterised as having the world's richest marine biodiversity. The Nature Conservancy (TNC) and World Wildlife Fund (WWF) have been working in partnership with the Wakatobi National Park Authority (or, *Balai Taman Nasional Wakatobi* [BTNW]) since 2003 and have assisted with the development of the MPA's revised zoning plan that was put into effect in 2006[15] with community input. The boundaries of WNP are congruent with those of the newly formed district (*kabupaten*) that was established in 2003.[16] The fact that the Wakatobi Regency is relatively new has significant impacts on the current state and future direction of development and natural resource management within the region. On the one hand, this poses difficulties because the newly formed regency-level government offices responsible for these tasks are still developing their respective management plan. However, on the other, this provides great opportunity since they are able to begin with essentially a clean slate and are not hindered by outdated management structures that often pose issues for the adaptive management of natural resources in other parts of the country.

2.2 Karimunjawa National Park

Situated 75 km off the northern coast of the heavily populated island of Java, Karimunjawa National Park (KjNP) encompasses 22 islands of the 27-island archipelago of Karimunjawa. Five of these islands are inhabited and, in 2009, had a total population of 9,157. KjNP was one of the first maritime areas in Indonesia to receive recognition for its importance in marine biodiversity conservation.[17] In 1986, it was formally declared a Strict Nature Reserve[18] and was subsequently declared a marine national park in 1988[19]. In 1999, its designation

changed to a national park, with a total area of 1,116 km^2, and it became known as the Karimunjawa National Park[20]. The totality of KjNP's marine area was designated as an MPA in 2001.[21] Up until 2005, the management of KjNP had been top-down, with virtually no community input. A significant change came in 2005 when a new MPA zoning system was put in place[22], with the help of an international non-governmental organisation (NGO), the Wildlife Conservation Society (WCS), as a replacement for the outdated zoning plan that had existed since the initial establishment of the MPA. The process to create the new 2005 zoning plan was much more inclusive and was the result of extensive community consultation.[23] WCS has been working in collaboration with Karimunjawa National Park Authority (BTNKj) since 2003 to manage the park.

2.3 Komodo National Park

Komodo National Park (KoNP), well known for its famed Komodo dragons (*Varanus komodoensis*), is located between the islands of Sumbawa and Flores, and encompasses a total area of 1,817 km^2.[24] Approximately 4,000 people reside within KoNP's borders, and a further 45,000 people reside in surrounding villages and rely heavily on park resources for their livelihoods. Situated at the southern edge of the Coral Triangle, its marine habitat is considered as one of the richest and most diverse for corals and fish in the world.[25] TNC began its collaboration with Komodo National Park Authority (BTNKo) in 1995 to assist with park management. Although this arrangement had been touted as Indonesia's first example of collaborative park management[26], the partnership fell apart in 2011 after tensions arose between BTNKo and TNC. In 2012, WWF stepped in to fill the hole in park management left by TNC's departure.

Although these three national parks possess several similar characteristics, such as collaborative management with international NGOs and management structures that are intended to take into consideration community input (co-management)[27], they also have striking differences in population size, socioeconomic conditions, total

protected area, local culture and MPA management history. This diversity in study sites enables deeper analysis in order to reach the research objectives of this project, as opposed to if homogenous sites had been selected. Furthermore, due to the fact that all three parks recognise and fully back the development of alternative livelihoods as an important component of their respective marine resource management strategies, they serve as excellent candidates for the purposes of this research.

3. Research Methods

For this study, a variety of qualitative and quantitative data and information were gathered from a combination of primary and secondary sources. Field interviews were conducted with several different types of key informants, such as NGO and government officials, community leaders, and representatives from various alternative livelihoods associations. Interviews were also carried out with community members and residents, such as fishermen, tourism workers, and seaweed and fish farmers. Key informants were selectively sampled in order to find information-rich respondents who could better shed light on the local dynamics of each respective region. For this study, it was important to have diverse key informants in order to gain information from different perspectives (i.e., community representatives vs. government officials). Community members were chosen for interviews using the snowball sampling technique, whereby respondents were asked to suggest other community members who could be interviewed.

The interviews were semi-structured in nature and focused on several themes related to the research objectives of this project. Questions were prepared in advance and adapted to suit each area and interviewee. Park officials were questioned on the success of alternative livelihoods implementation in their respective parks. Local residents were interviewed in order to ascertain their perceptions of the alternative livelihoods that had been proposed in their respective area. Secondary data were collected from relevant governmental organisations in order to analyse the state of various alternative livelihoods (i.e., tourism data, seaweed production data, local socioeconomic data, etc.). Both qualitative and quantitative

research methods were used to better understand the local dynamics in each area. Semi-structured interviews allowed for a certain degree of flexibility when conducting interviews and provided the opportunity to explore unforeseen yet pertinent lines of questioning relevant to the research objectives. Secondary sources provided quantitative data that enabled a better understanding of the prevailing socioeconomic conditions in each region.

4. Ecotourism

Ecotourism is by far the most heavily promoted alternative livelihood in all research sites selected, and for good reason due to its enormous foreseen potential. Some studies have suggested that ecotourism could pump as much as USD 26 billion into the Indonesian economy between the years 2004–2024.[28] Others have strongly suggested that ecotourism has significant potential for ecologically sustainable economic development, provided that certain institutional, cultural and political conditions are met, and that it is currently a missed opportunity in most parks throughout the country.[29]

Ecotourism, as defined by the IUCN, is

> [E]nvironmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features — both past and present) that promotes conservation, has low visitor impact, and provides for beneficially active socio-economic involvement of local populations.[30]

It should be noted that the term ecotourism is very flexible[31], given the fact that there has yet to be an agreed upon definition[32]. However, for the purposes of this study, the definition proposed by IUCN is well suited, as it incorporates the notions of minimal environmental impacts as well as socioeconomic benefits, both of which are crucial for sustainable growth.

Figure 7.1 shows increasing trends in both foreign visitors and foreign tourism revenue in Indonesia over the past decade. Despite a brief dip in tourism revenue that coincided with the global economic crisis of 2009,

foreign tourism revenue growth has been relatively stable, increasing from approximately USD 4.5 billion in 2003 to USD 10 billion in 2013. The importance of the tourism sector in Indonesia is undeniable. However, the challenge will be to build sound ecotourism projects that will be able to benefit from this steady increase in tourism in Indonesia.

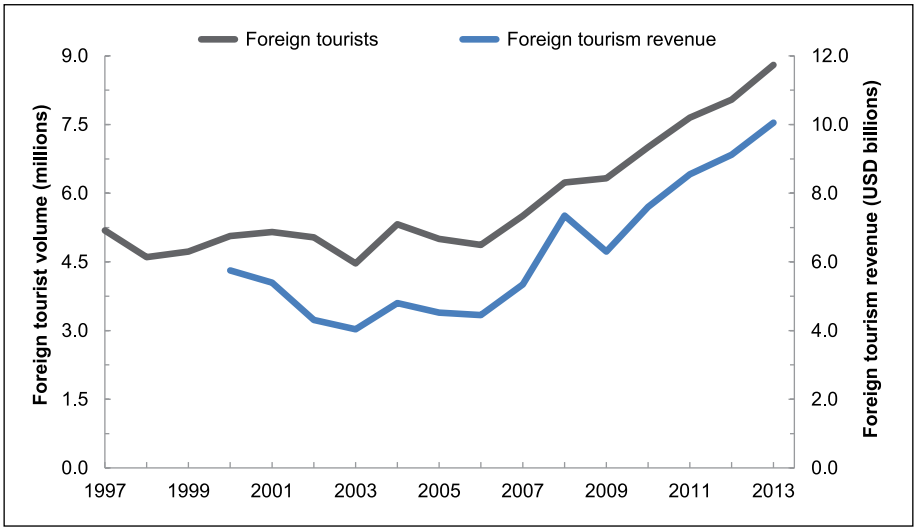

Figure 7.1: Foreign tourist volume (millions) and foreign tourism revenue (USD billions) in Indonesia, 1997–2013.

Source: Badan Pusat Statistik (Statistics Indonesia), 'Jumlah Kedatangan Wisatawan Mancanegara ke Indonesia Menurut Pintu Masuk, 1997–2014', accessed August 2014, http://www.bps.go.id/linkTabelStatis/view/id/1387.

Ecotourism may provide enormous potential, but does not come without its own set of issues and challenges. Ecotourism is often touted as a kind of panacea for regional development in virtually every MPA management plan; this despite the numerous studies that have shown the detrimental environmental and social impacts of the industry that range from land-ownership conflicts, failure to deliver promised community-level benefits, increased pressure on local resources and environmental damage.[33] Some researchers in this field have gone so far as to say that 'ecotourism is neither ecologically nor socially beneficial'[34]. However, despite the many issues confronting the notion of ecotourism as a benign industry,

it is still being promoted as a method for community development within conservation zones, such as MPAs. Ecotourism can therefore be seen as a kind of double-edged sword. If properly managed under the right set of circumstances, it has strong potential for sustainable growth and poverty reduction. Even so, it carries the risk of significant environmental impacts, if its development is not tightly controlled.

The state of ecotourism in each site varied greatly during the period of study. Figure 7.2 highlights the significant differences in the total number of visitors, foreign and domestic combined, for each park. WNP has seen a very modest increase in tourism during the past decade, with the number of visitors never exceeding 10,000. In contrast, KjNP and KoNP have seen much more drastic increases in the number of tourists, with their totals reaching approximately 40,000 and 65,000, respectively.

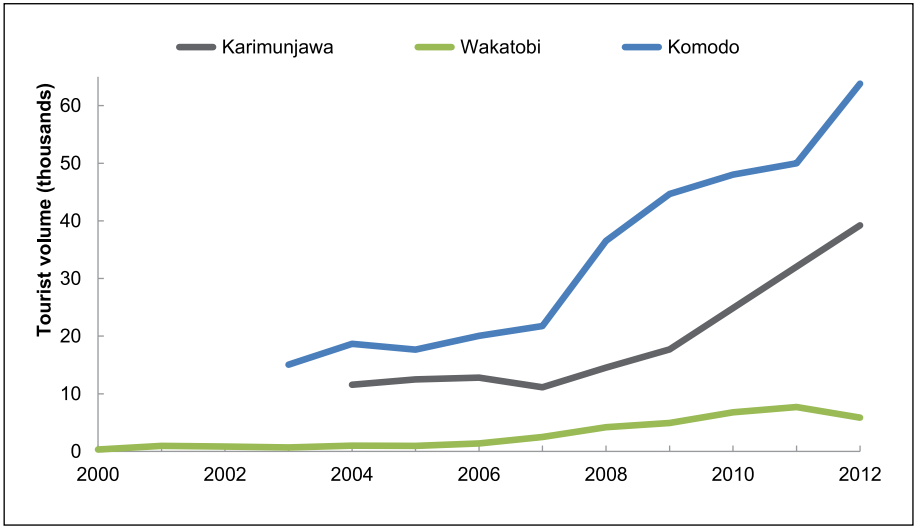

Figure 7.2: Total tourist volume (thousands) at each study site, 2000–2012.
BTNKj = Karimunjawa National Park Authority; BTNKo = Komodo National Park Authority
Source: Data provided by the Wakatobi and Karimunjawa Tourism Offices, BTNKj and BTNKo.

The following sections will detail the state of ecotourism in each site and describe the major issues found to be hindering its successful

development. Many issues were identified during on-site observations while respondents pointed out others during interviews.

4.1 Ecotourism development in Wakatobi National Park

Ecotourism in WNP is still in its early stages of development. Tourism in the region has increased from approximately 950 visitors in 2001 to 5,800 visitors in 2012.[35] Although these numbers show an increase of several orders of magnitude over a decade, the total number of yearly visitors to the park remains very modest when compared to other tourist destinations in Indonesia, such as the two other sites in this study, KjNP and KoNP. Given the region's richness in marine biodiversity and its vast territory to accommodate tourists, both government and MPA officials in WNP assert that there is enormous potential for growth in the industry. In fact, the regional government, seeing its significant untapped potential, is actively promoting the industry and has recently created a master plan for its development (RIPP)[36]. The plan emphasises community development, sustainable practices, conservation and environmental awareness raising. Despite the very well laid out plans found in the RIPP, these only speak to the future of ecotourism development in the region. Presented below is the current state of affairs in regard to ecotourism in WNP.

There are several reasons that ecotourism in WNP has yet to really take hold. Firstly, the isolated location of the park and the relatively expensive costs to reach it has limited the number of domestic tourists. One-way flights from Java can cost, on average, anywhere between USD 130–300 depending on the departure location. This relatively high airfare puts it out of reach for many domestic travellers. During the first half of the 2000s, the great majority of tourists visiting WNP were foreign, with domestic tourism only picking up in 2007 (Figure 7.3). Although domestic tourism now accounts for the majority of visitors to the region, its difficult accessibility and high cost to get to are still major factors influencing the development of ecotourism in the region.

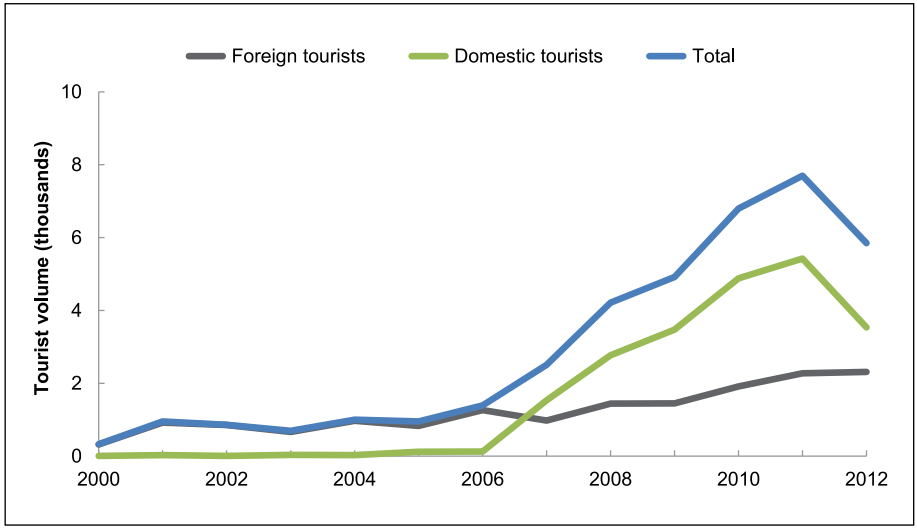

Figure 7.3: Tourist volume (thousands) at Wakatobi National Park, 2000–2012.

Source: Data provided by Wakatobi Tourism Office.

Secondly, MPA managers cite a lack of willingness among locals to enter the industry as another limiting factor. This lack of community initiative could be explained by a lack of awareness among villagers about ecotourism and by the fact that most individuals feel as though tourism benefits are not being felt within their communities. Tourism has yet to contribute in any significant way to the economies of most communities throughout WNP since a large portion of visitors stay in resorts that are typically isolated from local villages. Take, for example, the case of Wakatobi Dive Resort, a Swiss-owned resort that is one of the most popular and long established in the park. Located on one of the smaller and less densely populated islands of WNP, most of its visitors rarely venture outside of the resort's boundaries, with the exception of optional visits to a single adjacent village. Furthermore, aside from a few locally sourced goods, such as fish, much of the resort's food, which for the most part consists of western foods unavailable locally, is shipped directly from Bali using a boat that the resort owns and operates solely for this purpose. These circumstances create a situation where most

of the tourism benefits go directly to resort owners and employees, but contribute minimally to the economies of local communities. This makes it very difficult for tourism-related livelihood activities, such as souvenir making, tour guiding, restaurants, etc., to pick up throughout the park because very few tourists actually visit local villages.

Thirdly, in the few communities in WNP where tourism is taking hold, there is a lack of local capacity to properly manage the increase in visitors. A lack of restaurants, housing, and tour guiding and scuba diving operators can all be cited as examples of this. Recognising this issue, WWF is currently creating a capacity-building programme that will offer skills training to interested locals for ecotourism-related activities, such as souvenir making. The idea is that if local capacity is increased, ecotourism will be able to develop faster and, in turn, will incite more locals to enter the industry as benefits begin to be felt in the communities.

Lastly, corruption was posing problems for ecotourism development. For instance, government funds meant for individuals interested in setting up a tourism business were found to have mysteriously gone missing before reaching the intended recipients. Those affected by this have virtually no means for recourse. Several respondents, including members of the community as well as a couple of NGO officials, repeated these claims of corruption in the local government.

Thus, several key issues currently hinder ecotourism development in WNP. However, with its relatively rich and intact marine ecosystem and large area, there is much room for the industry to grow. Furthermore, because of the fact that Wakatobi is a newly formed regency, its governing framework is still being developed and is therefore more easily adaptable to its ever-changing environmental and socioeconomic conditions.

4.2 Ecotourism development in Karimunjawa National Park

Tourism in KjNP is currently undergoing a massive boom, with a large influx of domestic tourists coming from the neighbouring island of Java, the most densely populated island in Indonesia. Karimunjawa is also

becoming more accessible to foreign tourists thanks to the many tour operators in Yogyakarta, a popular stop on the tourism trail, that have increasingly been promoting KjNP as a tropical island destination. However, the number of domestic tourists still far outweighs the number of foreign tourists. The number of visitors to KjNP has increased from approximately 11,500 in 2004 to 39,000 in 2012 (Figure 7.4).[37] This massive upswing in tourism is undoubtedly good for KjNP's local economy, but at what environmental cost? The term 'tourism' is used here intentionally instead of 'ecotourism', as the kind of tourism currently taking place in KjNP is unlikely to fall under any conventional definition of ecotourism. The situation in KjNP more closely resembles that of mass tourism, where the main concern is attracting the maximum number of tourists with very little regard given to the impacts these visitors might have on the environment. Indeed, as a top BTNKj official pointed out, the environmental impacts from tourism in Karimunjawa are already becoming evident and BTNKj is currently busy assessing the degree of coral damage caused by tourism.

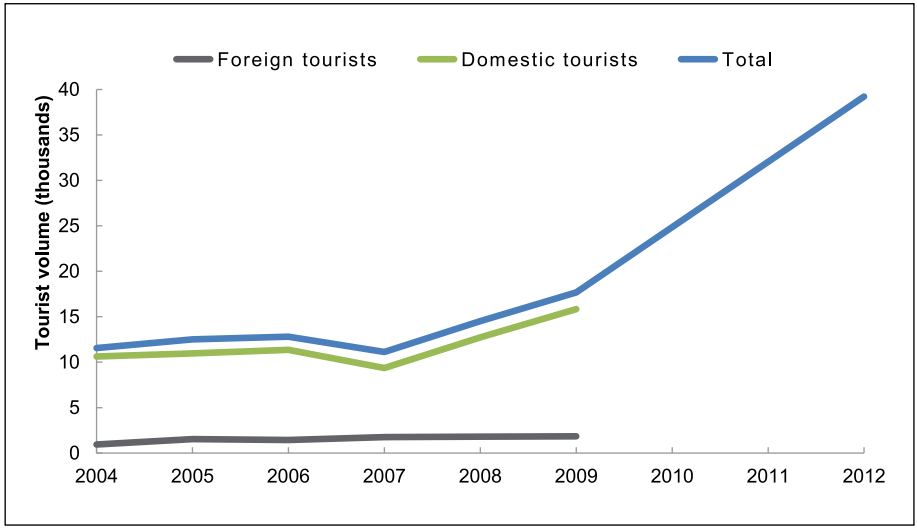

Figure 7.4: Tourist volume (thousands) at Karimunjawa National Park, 2004–2012.

Source: Data provided by Jepara Tourism Office.

On the one hand, this massive increase in tourism is exactly what MPA managers wanted, and many fishermen are indeed entering the industry. However, on the other, we find several major issues that threaten the sustainability of the tourism industry in KjNP. With such rapid growth, the local capacity to properly manage tourism is severely lacking. Human, infrastructural and institutional capacities need to catch up if the industry hopes of attaining sustainability. Although a few resorts are located on the outer islands of the park, during the busy tourist seasons enormous pressure is placed on the limited resources of Karimunjawa village since most homestays and resorts are located either nearby or directly within the village itself. This massive influx of visitors places enormous pressure on the village's freshwater and food supplies, not to mention the increased fishing pressure that is placed on the park's fish stocks in order to meet the demand for freshly caught grilled fish that is popularly enjoyed by visitors. In one example, a manager of a restaurant in Karimunjawa recounted how food supplies became drastically low during a bout of bad weather that made it impossible for the ferry connecting KjNP with Java to operate. This created a situation where frustrated visitors were trapped in KjNP for approximately one week as food supplies dwindled and became dangerously low.

The lack of environmental and conservation knowledge among tour guides poses a serious problem. Very few guides offer any kind of environmental awareness raising tips to tourists. The consequences of this are that many guides and tourists are regularly seen standing directly on corals and throwing garbage into the sea. Furthermore, at present, there is no coordination within the guiding industry in KjNP nor is there an established set of best practices for tour guides and boat operators. BTNKj has already offered two workshops to promote environmental awareness among tour guides and is also currently working on a programme for the following year that will focus on ecotourism education and environmental awareness raising, among other things. This is a promising initiative; however, only time will tell if this will be enough to curb current negative trends of environmental impacts caused by tourism.

So far, the tourism offices at the regency and provincial levels have mainly focused on the promotion of tourism in KjNP and have paid very little attention to regulating it in order to assure its proper management. With its close proximity to the heavily populated island of Java, and its affordability in terms of travel, these promotion campaigns for KjNP have clearly worked in driving the expansion of the industry. However, to the detriment of its environment, the support mechanisms to properly manage such a massive upswing in visitors are not yet in place. In response, one WCS official advocates the introduction of a limit on the number of visitors that can visit the park at a given period as a means of controlling the industry. However, this would require determining the carrying capacity for KjNP, something that is yet to be done by any management body or organisation.

Lastly, the unequal distribution of tourism benefits in the region poses another issue. Most of the benefits are going to outside interests or are staying within the village of Karimunjawa and are not being equally shared with the other villages of Kemujan and Parang. When speaking with local government officials, they were quick to point out that non-local businessmen, often based in Java, own most of the hotels and resorts in KjNP. Similarly, many of the tours in Karimunjawa are offered by tour operators based on Java. This creates a situation where many of the guides working in the park are either from Java or are locals who have managed to establish connections with outside tour operators.

4.3 Ecotourism development in Komodo National Park

The ecotourism industry in KoNP has also undergone a vast expansion during the last decade. The number of tourists has increased from approximately 15,000 in 2004 to over 60,000 in 2012 (Figure 7.5). In contrast with KjNP, the great majority of tourists coming to KoNP are foreign, with approximately 55,000 foreign visitors in 2012 compared to less than 10,000 domestic tourists in the same year. Tourism here is very much based on scuba diving, with roughly 80 per cent of all tourists

being scuba divers. The town of Labuan Bajo is situated outside the park boundaries on the island of Flores and serves as the main gateway into the park. It has therefore been greatly affected by tourism development in the region and issues, such as spatial planning and waste management, are now beginning to gain importance.

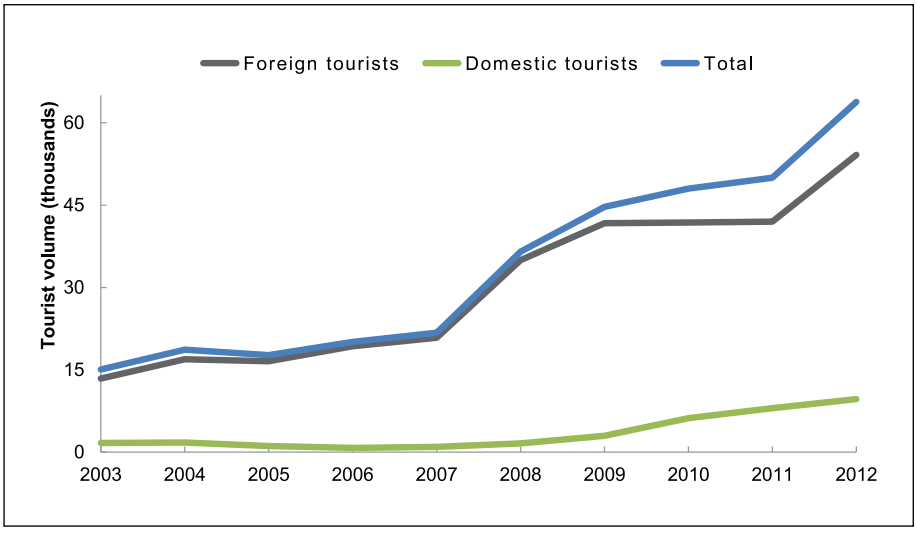

Figure 7.5: Tourist volume (thousands) at Komodo National Park, 2003–2012.

Source: Data provided by Komodo National Park Authority, 2014.

With large amounts of foreign and Indonesian investments coming into the region, real estate prices have increased exponentially in recent years. For example, a building that would have cost IDR 10,000,000/year to rent in 2008 can currently cost as much as IDR 80,000,000/year. This dramatic increase in real estate prices is making it more difficult for locals to enter the tourism industry. Some are forced to sell souvenirs to visitors by peddling it in restaurants because they are unable to find the capital to set up a storefront.

Capacity building for tourism is currently being offered at several high schools in Labuan Bajo and in neighbouring cities. Here, students are able to receive skills training in one of three fields — hospitality, culinary

and travel agency. Although this kind of skills training is undoubtedly a step in the right direction, many graduates are stuck working minimum-wage low-level tourism jobs, such as waitressing. The private sector has undertaken capacity-building measures in the scuba diving industry. Many foreign-owned dive shops offer free training to local employees who wish to earn their dive master certification, which allows them to work as scuba diving guides.

Although some studies have raised concerns about the negative impacts of recreational diving on coral reef ecosystems through direct damage to coral and pollution from dive boats[38], others have argued that scuba diving can achieve sustainable levels of use that are in line with the principles of ecotourism as long as proper management of the activity is in place[39]. Unfortunately, at present, there is no formalised management plan that regulates the diving industry in KoNP and, according to several dive operators interviewed, damage from bad scuba diving practices poses a serious threat to the health of local marine ecosystems.

Standards and practices vary between different scuba diving outfits operating within the park. Although some adhere to very strict, low-impact standards, others have been known to allow questionable practices in order to attract business. Some examples of this include letting unqualified divers into some ecologically sensitive dive sites and using metal hooks to secure their clients to the reef in areas with strong currents. However, some in the industry are currently trying to establish an informal organisation for dive operators in an effort to better manage the industry. One of their main objectives is to establish a general set of best practices that all member operators would be expected to follow.

5. Mariculture

Another industry often endorsed in the alternative livelihoods discourse is mariculture. This is understandable considering that the Indonesian mariculture industry has undergone an enormous boom in the

past decade. For example, the production of seaweed has grown exponentially from 223,080 tonnes in 2002 to 6,514,854 tonnes in 2012[40]; this represents a massive 2,820 per cent increase over a 10-year period. With mariculture showing such promise for coastal area development, it has naturally been adopted in virtually every MPA's alternative livelihoods development strategy. This research is mainly concerned with mariculture, which is a specialised form of aquaculture that takes place exclusively in saltwater environments. In all our research sites, the two leading forms of mariculture being promoted by MPA managers were fish and seaweed farming.

The type of seaweed farming practised in all our research sites was relatively straightforward. Empty bottles are attached to a long monofilament line at intervals of about a few meters along its length, so that it floats near the surface of the water and both of its ends are anchored to the sea floor. Seedlings are then attached to the line at intervals of a few dozen centimetres and are cultivated in the water for 2–3 months before reaching an appropriate size for harvest. Once harvested, the seaweed is spread out and left to dry under the sun, after which it is ready for sale in local and regional markets. The most commonly harvested type of seaweed is *Eucheuma cottonii*, from which a hydrocolloid compound called carrageenan is extracted. Carrageenan compounds are important ingredients in many products in today's modern food and dairy industry.[41]

In fish farming, juvenile fish are placed in floating cages know as grow-out units, which are themselves situated in relatively shallow waters close to shore. The fish are then grown for a period of several months (grow-out times vary according to the species being farmed) before reaching market size.

Mariculture, especially seaweed farming, is reasonably simple to implement and, along with ecotourism, is considered by MPA managers as a promising candidate for alternative livelihoods development. However, as the following section shows, there are several key issues that currently pose problems for its successful development.

5.1 General mariculture issues

Disease. The most pervasive issue observed during research for both fish and seaweed farming was pervasive disease. In each of the research sites, disease posed a constant problem for fish and seaweed farmers who have virtually no means to defend against its negative impacts. The two principal diseases affecting seaweed crops in all sites and throughout Indonesia are locally known as 'ice-ice' and '*jamur*' (epiphyte infestation). These diseases are caused by several environmental parameters, such as high water temperature, low salinity, low light intensity and low water movement.[42] Site selection is therefore extremely important for the success of seaweed crops. Once a seaweed crop is affected by disease, it can negatively impact the production of the entire crop and, if not properly controlled, can lead to its collapse.

As for fish farming, species-specific viral diseases continually threaten fish stocks. More specifically, groupers, the most common fish being farmed in the research sites, are affected by the disease viral nervous necrosis. Although fish farmers can reduce the risk of disease by using a multi-species approach in their grow-out cages, this is only a mitigating effort.[43] Furthermore, most fish farmers are mainly interested in farming grouper because of its high market value, thereby making their fish farming operations more vulnerable to disease.

A common grievance for farmers in the research sites was the lack of support from the government or other institutions to the mariculture industry. For example, there are no studies being done in any site to help farmers improve their seaweed farming practices. Farmers have very little knowledge about how to better optimise their crops or better mitigate disease. As for fish farming, vaccines do exist to prevent disease.[44] However, due to the high cost of vaccines and their difficult availability, this option is not available for most fish farmers.

Seedling quality and availability. Another hindering factor to the development of the mariculture industry was the difficulty in acquiring either seedlings for seaweed farming or fingerlings for fish farming. In

virtually every site, farmers were required to purchase seedlings and fingerlings from outside. The only exception was KoNP, where a fish hatchery was built by TNC in the early 2000s and subsequently transferred to a local company in 2005. However, even with this considerable input of capital and expertise, the initiative had difficulty reaching satisfactory survival rates of juveniles produced from broodstock.[45] The on-site production of fingerlings and seedlings is currently not feasible for small coastal communities, such as those found within the research sites, due to the large amount of capital and expertise required for its successful undertaking. Thus, low availability of seedlings and fingerlings presents a bottleneck for the successful development of the industry. The isolated locations of most Indonesian MPAs further exacerbate the issue due to logistic difficulties in transporting seedlings and fingerlings from their production centres that are usually located far away on Java or Lombok. What makes matter worse is that most seedlings purchased for seaweed farming already contain traces of epiphytes and therefore propagate disease throughout the rest of the crop.[46]

Carrying capacity. Carrying capacity was another limitation for the development of mariculture as an alternative livelihood. As things stand, the carrying capacity for each site is unknown and therefore it is impossible to know at what scale different mariculture operations will become environmentally unsustainable. Habitat destruction due to mangrove clearing, which is commonly associated with shrimp farming, is much less of a concern when dealing with fish and seaweed farming since these types of mariculture operations normally float in shallow waters near to shore, leaving the coastal environment relatively unscathed. Nonetheless, different types of mariculture carry with them different levels of environmental impacts. For example, when compared to fish farming, the cultivation of seaweed has been shown to have relatively benign impacts on the marine environment.[47] However, some concerns exist over the negative impacts to corals due to shading, and the changes in patterns of sedimentation, water movements and erosion.[48] As for fish farming, the negative impacts commonly associated with the practice include the discharge of suspended solids that affect

water quality, nutrient enrichment of surrounding waters that can lead to anoxic conditions and the destruction of benthic habitats.[49] At small scales, MPA managers generally agree that the impacts of mariculture are negligible. However, some of our respondents have emphasised that it is currently unknown where the threshold lies between sustainable and unsustainable levels of mariculture.

If mariculture is to succeed as a viable alternative livelihoods practice for community development, there will need to be a significant expansion of the industry. However, geographic constraints within MPAs pose a severe limitation to such expansions because of the fact that operations, such as seaweed farming, require vast marine areas. Most MPAs have a limited number of areas that can provide good sites for the successful implementation of mariculture operations. With the high susceptibility of seaweed to disease due to improper site selection, this further represents a severe limitation.

6. Overarching Alternative Livelihoods Development Issues

Our results indicate that there are several overarching issues that affect the successful development of alternative livelihoods across all research sites. These issues can be divided into three major categories: (i) governance and regulations; (ii) local capacity; and, (iii) viability.

6.1 Governance and regulatory issues

As mentioned above, the potential for ecotourism development in Indonesia's national parks is tremendous considering their vast and unique natural resources. Indonesia has recently adopted several laws that are meant to insure the sustainable development of tourism throughout the country. Some of these regulations include Law No. 32/2009 that is meant to control the environmental impacts of tourism[50] and Law No. 10/2009 that essentially accepts the concept of sustainable tourism and requires 'that tourism must aim to sustain both culture and the environment'[51].

Despite these positive steps forward in building a legal framework for ecotourism, several governance issues threaten the sustainability of the industry, which is presently oriented towards short economic benefits and is proving to have detrimental impacts on the environment and community welfare.[52] Since the passing of the decentralisation laws in 1999, the responsibility to govern sectors, such as tourism, has been transferred from the central government to local regency-level administrations. The role of the central government is now more focused towards developing policy frameworks so that local governments can implement their own policies for tourism development independently. However, local administrations are often unequipped to take on such responsibilities, or gaps and overlaps in development planning often arise due a lack of coordination over jurisdiction between various government offices.[53]

In Karimunjawa and Komodo, NGO staff actively involved in trying to assist with the development of ecotourism commonly lamented about the fact that there was a severe lack of proper tourism planning or enforcement of regulations from the local government agencies responsible for tourism development. Many pointed out that, presently, regional tourism offices mainly concentrate their efforts on the promotion of tourism in their respective regions and do not offer any regulatory enforcement to control its development.

Governance issues are central when considering the multitude of problems facing alternative livelihoods development in MPAs, as well as community development, in general, throughout Indonesia. Unfortunately, 'corruption, poor rule of law, clientelism inside and outside the government, and lack of incentives to do work on a variety of levels within government bureaucracies' is commonplace throughout the country and is having detrimental impacts on sustainable growth.[54] With this being the case, major changes are needed at the local government level if any alternative livelihoods initiative is to succeed.

Another major problem for the development of ecotourism is the lack of coordination between various governmental and non-governmental

institutions, as well as the private sector. This creates a situation where the proper management of ecotourism is very difficult and can even lead to clashes of interest between various stakeholders. The result is gaps, overlaps and diverging directions in the activities of different institutions that are supposedly all working for the same goal in a given region.[55] NGOs, such as WWF in WNP and Eco Flores in KoNP, are taking steps to improve collaboration between institutions operating in their respective areas, but are still in the preliminary stages of this effort.

6.2 Local capacity

In all research sites, there were examples of local capacity lacking in one form or another for proper ecotourism development. The most glaring example was Karimunjawa, where local communities and governments are struggling to keep up with the massive increase in visitors to the area. The resulting environmental impacts are threatening to undermine the conservation efforts of MPA managers. Here, capacity building for ecotourism is being done retroactively, after the strong push by the government for its promotion, in the hope of controlling the industry and mitigating further environmental damage.

In the case of WNP, local capacity, at present, seems to be sufficient for the sustainable management of ecotourism at current levels. Several measures have already been put in place in order to mitigate its negative environmental impacts, such as prohibiting tourists from using harpoons for sport fishing of reef fishes, etc. However, the concern here among MPA managers is that, if local capacity remains at current levels, the growth of ecotourism will be hampered. They believe that, if they can build up local capacity, the growth of ecotourism will inevitably follow.

6.3 Viability

The viability of alternative livelihoods practices should also be assessed in order to determine if it can realistically provide sustainable growth in the communities living within an MPA. Park managers commonly promote mariculture as a promising livelihood activity for fishermen to

transition into in order to improve the living standards of their households. Mariculture is often regarded as an extremely simple livelihood activity with a relatively low barrier to entry, which may be true in theory. However, this oversimplified view of the practice does not put enough emphasis on the several limitations that hinder the growth of the industry. Disease, insufficient availability of seedlings and fingerlings, limited space for seaweed farming expansion and fish farming's negative impacts on the marine environment all limit the scalability of the industry in a given area. Furthermore, the capital-intensive nature of fish farming renders the practice inaccessible for most small-scale fishermen.

6.4 Issues with fostering livelihood change

Management plans for MPAs often seem to take for granted the notion that fishermen would readily be willing to transition into other livelihood activities that are, in some cases, extremely different from fishing, such as ecotourism. This common assumption may be very problematic and ignores the fishing and seafaring cultures engrained in many of these coastal communities. Policies are often built on the erroneous and oversimplified conceptions of coastal fishing communities. Fishermen have historically been described as the 'poorest of the poor', who have only entered the fishing industry after being forced out of traditional occupations, such as farming.[56] This common misconception has led to many policies being constructed around the belief that fishing is an 'occupation of last resort'[57], only being entered into by individuals without any other opportunities for alternative employment and that such individuals would be ready to transition into alternative livelihoods if only given the opportunity.[58] These misconstrued images of small-scale fishing communities ignore the fact that most fishermen are actually not interested in changing livelihoods. A study conducted by Pollnac, Pomeroy and Harkes in the countries of Vietnam, Indonesia and the Philippines, for instance, demonstrated that in fact only a minority of fishermen would actually be willing to change occupations if given the opportunity, citing job satisfaction and income as the main reasons for staying in fisheries.[59] The study ultimately concluded that 'there is no support for the assumption that the majority of fishers would leave

fishing if an alternative were available'.[60] Such studies indicate that achieving sustained long-term livelihood changes are very difficult because of several socioeconomic factors, such as family tradition and occupational satisfaction.[61]

Despite issues relating to convincing fishermen to switch occupations, this study found that younger generations were much more interested in entering an industry, such as tourism, when compared to older, more established fishermen. This illustrates that such livelihood shifts can often take significant amounts of time, the duration of which can be multi-generational. Unfortunately, many donor-driven conservation and development projects that promote alternative livelihoods are short-term and unsustainable by nature.[62] These projects fail to build up sufficient local capacity in order for their activities and related outcomes to be sustained.[63]

Some respondents involved in MPA management were of the opinion that fishermen who are interested in alternative livelihoods must fully transition into their newfound profession, so that it becomes not only their primary livelihood activity but also their only one. Their reasoning, whether accurate or not, is that if fishermen merely adopt ecotourism as a secondary livelihood, all the while continuing to fish, their environmental subjectivities will not ever align with the concepts of conservation and ecotourism because they will not be fully invested in the new industry. According to this rationale, less effort will be placed in successfully developing ecotourism so long as people are involved in both industries. This idea, however, goes against the diversified livelihood strategies that are commonly relied upon in fishing communities in order to increase their resilience against ecological or economic shocks.[64] Asking households to transition completely into ecotourism would greatly increase their vulnerability to a multitude of factors that are largely out of their control.

7. Lessons Learned and Future Direction

This research has outlined several factors that influence the successful development of alternative livelihoods within Indonesian MPAs. Many of

these factors are site specific while other more fundamental issues are overarching in nature and are present in each of the three MPAs explored in this study. By keeping these in mind, the following recommendations could be made in the hopes of better informing policy frameworks that guide the development of alternative livelihoods in MPAs.

Firstly, the issue of capacity building for ecotourism development should be a main priority for any alternative livelihoods development strategy given ecotourism's enormous foreseen potential. Capacity building should be done proactively, so that local communities and relevant actors are able to bear the pressure brought on by increased ecotourism. Building up capacity proactively is key so as to avoid situations, as currently found in KjNP, where uncontrolled tourism development is having direct negative impacts on the marine environment.

Secondly, strong and coherent regulatory frameworks should be established and enforced at local levels to support a sustainable ecotourism industry. These should be adapted to deal with not just the physical impacts of ecotourism, but its social impacts as well. More specifically, carrying capacities should be implemented for each site and the number of visitors should be managed in accordance. Furthermore, there should be an agreed upon set of best practices for ecotourism operators to follow in order to prevent possible environmental impacts of increased tourism traffic in ecologically sensitive areas.

Thirdly, collaboration between governing bodies, NGOs and local groups needs to be improved in order to better synchronise their efforts and to avoid conflicts. This issue might prove to be the most difficult to tackle, given the current state of affairs in Indonesian government bureaucracies.

Lastly, carrying capacities for mariculture should be established and enforced as soon as possible in order to protect against environmental impacts that would occur if the industry were to expand significantly in areas with favourable conditions. Furthermore, efforts should be made to provide assistance for farmers to better cope with disease and to optimise crop yields. Training programmes should be established to

educate farmers not only on the nature of various diseases affecting their crops but also on techniques they can follow to mitigate their negative impacts, such as multi-species crops for fish farms. Further assistance could be provided through research, grants and subsidies for the industry.

8. Conclusion

In this chapter, the main issues facing successful alternative livelihoods development in three Indonesian MPAs — WNP, KjNP and KoNP — have been discussed. Findings suggest that this task is often much more complex than policymakers typically make it out to be, namely due to the complex geographical, governmental and socioeconomic specificities of each site.

Ecotourism development faces several challenges, such as unimplemented regulatory frameworks, lack of willingness from local communities to enter the industry and a general lack in local capacity for its sustainable development. If ecotourism initiatives are to succeed, local capacity must be built ahead of time for the industry to reach sustainability. Mariculture faces its own challenges that place the viability of the industry as an alternative livelihood into question. Seaweed farming is constantly plagued by disease and has limited scalability due to the large amounts of space needed for the practice. This is further exacerbated by the fact that the success of crops is largely dependent on environmental factors that are directly determined by site selection. As for fish farming, species-specific viral diseases constantly threaten the health of fish stocks. Furthermore, the anoxic conditions that can be created by fish farms limit the scale at which this industry can operate.

As MPAs continue to gain traction as a coastal resource management strategy throughout the developing world, understanding their socioeconomic implications will become increasingly important. As we have seen, the promotion of alternative livelihoods is far from straightforward. However, they can still serve an important role in sustainable growth, as long as proper supporting mechanisms are put in place to aid their development. Of all alternative livelihoods practices

discussed in this chapter, ecotourism undoubtedly shows the most promise, even though much work needs to be done not only to promote its development but also to properly control it.

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ABOUT THE ASEAN-CANADA RESEARCH PARTNERSHIP

While Canada has been a dialogue partner to ASEAN since 1977, the deepening of ASEAN and Canada Track 1 relations in recent years has increased collaborative efforts in addressing pertinent regional issues of common interest. However, improved relations at the Track 1 level will require more groundwork at the Track 2 and 3 levels.

It is with this in mind that the ASEAN-Canada Research Partnership was initiated by the RSIS Centre for NTS Studies and the Institute of Asian Research (IAR) in the University of British Columbia. Supported by the International Development Research Centre (IDRC), Canada, this initiative is also a response to growing interest within the Canadian and Southeast Asian research communities to jointly examine ASEAN's role and impacts, and exchange experiences in order to explore development opportunities and address social, economic and environmental problems.

The ASEAN-Canada Research Partnership seeks to build stronger research capacity and partnership between and among Canada and ASEAN countries, institutions and individuals. Specifically, it seeks to:

- Enhance understanding of Southeast Asia development dynamics and ASEAN's role in addressing such dynamics.
- Facilitate knowledge, experience and skills exchange among Southeast Asian and Canadian scholars.
- Strengthen ASEAN-Canada relations through the establishment of an informal research network among think tanks, academic institutions, government officials, multilateral agencies and other stakeholders.
- Contribute to the ASEAN-Canada Plan of Action by providing a shared evidence base for policies and interventions.

The partnership covers two themes over the course of the three years. The first theme 'Towards Balanced Growth — Alternative Development Models and Redistribution Mechanisms' (2012–2013) seeks to address the challenge of finding development options or policy sets that achieve the ASEAN goals of greater regional integration and strong economic growth but without the increased inequality that has become pervasive

in the last two decades. The second theme 'Natural Resources Management for Sustainable Growth' (2013–2014) seeks to find means of improving systems for managing natural resources to allow sustainable economic growth without degrading common resources as illustrated by increased atmospheric pollution and concentrations of greenhouse gases, overharvesting and degradation of forest resources, as well as overharvesting of oceans and depletion of fisheries.

The ASEAN-Canada Research Partnership was officially launched on 20 January 2012 along the sidelines of the commemoration of the 35th Anniversary of ASEAN-Canada relations at the ASEAN Secretariat, Jakarta, Indonesia.

ABOUT THE RSIS CENTRE FOR NON-TRADITIONAL SECURITY (NTS) STUDIES, NTU

The **RSIS Centre for Non-Traditional Security (NTS) Studies** conducts research and produces policy-relevant analyses aimed at furthering awareness and building capacity to address NTS issues and challenges in the Asia-Pacific region and beyond.

To fulfil this mission, the Centre aims to:

- Advance the understanding of NTS issues and challenges in the Asia-Pacific by highlighting gaps in knowledge and policy, and identifying best practices among state and non-state actors in responding to these challenges.

- Provide a platform for scholars and policymakers within and outside Asia to discuss and analyse NTS issues in the region.

- Network with institutions and organisations worldwide to exchange information, insights and experiences in the area of NTS.

- Engage policymakers on the importance of NTS in guiding political responses to NTS emergencies and develop strategies to mitigate the risks to state and human security.

- Contribute to building the institutional capacity of governments, and regional and international organisations to respond to NTS challenges.

Our Research

The key programmes at the **RSIS Centre for NTS Studies** include:

1) Climate Change, Resilience and Sustainable Development
2) Energy Security
3) Food Security
4) Health Security
5) Peace, Human Security and Development
6) Water Security

Our Output

Policy Relevant Publications

The **RSIS Centre for NTS Studies** produces a range of output such as research reports, books, monographs, policy briefs and conference proceedings.

Training

Based in RSIS, which has an excellent record of post-graduate teaching, an international faculty, and an extensive network of policy institutes worldwide, the Centre is well-placed to develop robust research capabilities, conduct training courses and facilitate advanced education on NTS. These are aimed at, but not limited to, academics, analysts, policymakers and non-governmental organisations (NGOs).

Networking and Outreach

The Centre serves as a networking hub for researchers, policy analysts, policymakers, NGOs and media from across Asia and farther afield interested in NTS issues and challenges.

The Centre is the Coordinator of the ASEAN-Canada Research Partnership (2012–2015) supported by the International Development Research Centre (IDRC), Canada. It also serves as the Secretariat of the initiative.

In 2009, the Centre was chosen by the MacArthur Foundation as a lead institution for its three-year Asia Security Initiative (2009–2012), to develop policy research capacity and recommend policies on the critical security challenges facing the Asia-Pacific.

It is also a founding member and the Secretariat for the Consortium of Non-Traditional Security (NTS) Studies in Asia (NTS-Asia Consortium).

More information on our Centre is available at www.rsis.edu.sg/nts

ABOUT THE S. RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES

The S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University, was inaugurated on 1 January 2007 as an autonomous School within Nanyang Technological University (NTU), upgraded from its previous incarnation as the Institute of Defence and Strategic Studies (IDSS), which was established in 1996.

The School exists to develop a community of scholars and policy analysts at the forefront of Asia-Pacific security studies and international affairs. Its three core functions are research, graduate teaching and networking activities in the Asia-Pacific region. It produces cutting-edge security related research in Asia-Pacific Security, Conflict and Non-Traditional Security, International Political Economy, and Country and Area Studies.

The School's activities are aimed at assisting policymakers to develop comprehensive approaches to strategic thinking on issues related to security and stability in the Asia-Pacific and their implications for Singapore.

For more information about RSIS, please visit www.rsis.edu.sg

NOTES

NOTES

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