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The Problem with Environmental Security: Challenging the either/or approach of national versus human security in the context of the Mekong River Basin.

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A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy

Centre for International Security Studies

University of Sydney Business School

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Statement of Originality

This is to certify that to the best of my knowledge, the content of this thesis is my own work. This thesis has not been submitted for any degree or for any other purposes.

I certify that the intellectual content of this thesis is the product of my own research and analysis and that it is an original contribution to the literature on environmental security. I assert the intellectual property and moral rights to the work. All assistance received in preparing this thesis has been acknowledged in the 'acknowledgements' section. All sources used in the research for this thesis have been acknowledged in footnotes and bibliography by conforming to the 'Chicago' referencing system.

Christopher G. Baker

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List of Abbreviations

ADB	Asian Development Bank
APEC	Asia Pacific Economic Cooperation
ARF	ASEAN Regional Forum
ASEAN	Association of Southeast Asian Nations
BDS	Basin Development Strategy
BOOT	Build, Own, Operate, Transfer
CE	Critical Ecology
CSCAP	Council for Security Cooperation in the Asia Pacific
DES	Demographic and Environmental Stress
EACH-FOR	Environmental Change and Forced Migration
EAS	East Asia Summit
ECAC	Environmental Change and Acute Conflict Project
EGAT	Electricity Generating Authority of Thailand
EIA	Environmental Impact Assessment
ENCOP	Environment and Conflicts Project
EPS	Environment, Population and Security Project
ESS	Environmental Security Studies
ESVC	Environmental Scarcities and Violent Conflict
GDP	Gross Domestic Product
GECHS	Global Environmental Change and Human Security
GMS	Greater Mekong Subregion
GMS – CEP	Greater Mekong Subregion – Core Environment Program
GNI	Gross National Income
GoL	Laotian Government/Government of Laos
GW	Gigawatts
HS	Human Security
IDP	Internally Displaced People
IFI	International Financial Institution
IMF	International Monetary Fund
IOM	International Organisation for Migration
IS	International Security

IWRM	Integrated water and Related Resource Management
Lao PDR	Lao People’s Democratic Republic
LDC	Least Developed Country
LMB	Lower Mekong Basin
MRB	Mekong River Basin
MRC	Mekong River Commission
MRC – SOB	Mekong River Commission – State of the Basin Report
MW	Megawatts
NGO	Non-Government Organisation
NS	National Security
NT2	Nam Theun 2 Dam
NTPC	Nam Theun 2 Power Company
PNPCA	Procedures for Notification, Prior Consultation and Agreement
PoE	Panel of Experts
PRIO	Peace Research Institute, Oslo
REI	River Ecosystem Integrity
RT	Residence Time
SAARC	South Asian Association for Regional Cooperation
SCO	Shanghai Cooperation Organisation
SEA	MRC Strategic Environmental Assessment
SES	Systemic Environmental Security
TE	Trapping Efficiency
UXO	Unexploded Ordinance
UN	United Nations
UNDP	United Nations Development Program
UNEP	United Nations Environmental Program
UNHCR	United Nations High Commission for Refugees
UNU-EHS	United Nations University Institute for Environment and Human Security
US	United States
US DoD	United States Department of Defence
VFA	Nakai Plateau Village Forestry Association
WCED	World Commission on Environment and Development
WQM	Water Quality Monitoring
WWF	World Wide Fund for Nature
XBF	Xe Bang Fai (river)

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Introduction

Man is still utterly dependant on the natural world but now has for the first time the ability to alter it, rapidly and on a global scale. Because of that difference, Einstein's verdict that "we shall require a substantially new manner of thinking if mankind is to survive" still seems apt.

Jessica Tuchman Matthews: *Redefining Security*.¹

The Environment and Security or Environmental Security?

One of the most important ideas to emerge from security studies in the past forty years is the field of research commonly known as environmental security. The scale and pace of both environmental changes and global population growth in the 20th and 21st century have given rise to concerns about how these may lead to serious negative security outcomes. These concerns revolve around issues such as: conflict between nations over scarce resources; state instability due to dwindling supplies of food and water; negative outcomes for individuals and communities due to both increasingly severe climatic events and renewable resource scarcity; and the vulnerability created by the impacts of a changing climate and ecosystem loss. These concerns about the interaction between security and the environment have led to a range of security analyses that approach them from a variety of perspectives.

Although there is a huge interest in the linkages between the environment and security from both academic and policy perspectives, there is no agreement as to how to understand or interpret these linkages. This provides a certain richness to the theoretical approaches to environmental security, however it does not provide policymakers with any clear or readily understandable way of applying theory in practice. Unlike traditional theories of international security such as realism and liberalism, environmental security has not had a growing impact on national security that it might have expected to – given the environmental issues raised above. On the

¹ Jessica Tuchman Mathews, "Redefining Security," *Foreign Affairs* 68, no. 2 (Spring 1989).

other hand, environmental security has been more accepted by the field of human security. The problem with this is that there is no analytical bridge between the environment (environmental science), the state (traditional security and international relations) and the individual (human security). This is a problem because national and international policymakers generally continue to look through the lenses of the traditional theories of realism and liberalism in order to understand the complex and evolving political/environmental/social challenges that are arising as a result of a rapidly changing environment and a biosphere under immense pressure. Whereas human security analyses more readily engage with the social issues that are linked to a changing environment, it generally rejects the statist premise that underlines realism and liberalism.

This thesis engages with the problems that arise due to the disparate nature of Environmental Security Studies (ESS) and seeks to understand why environmental security is such a splintered notion. It also investigates whether there are similar ideas or themes running throughout the varied and fragmented literature on environmental security. Finally, based on these investigations, this thesis forwards an original and unique way of understanding the relationship between the environment and security, linking the state, the environment and the individual: Systemic Environmental Security.

Statement of the Thesis - Hypothesis

The central premise or distinctive hypothesis driving this thesis is that although there is no central theoretical core to Environmental Security Studies, there is a discernible recurring theme within the environmental security discourse. If operationalised to form a synthetic analytical framework – known as Systemic Environmental Security – this more integrative analysis provides unique security insights that would not otherwise be achieved. Furthermore, it is assumed that this systemic approach to environmental security provides a valuable way of analysing environmental problems from a security perspective and that this will contribute to the discipline of security studies more generally. The sections below will outline the research questions and the specific contribution of the thesis.

Outline of Research Questions.

In order to address the above hypothesis, three research questions are below advanced and will be pursued throughout this thesis:

1. Does environmental security have a central theoretical core that enables it to coherently analyse the linkages between security and the environment?
2. Is there a common theme that can be discerned within the literature on environmental security?
3. Does Systemic Environmental Security provide any unique insights into the relationship between security and the environment?

Contribution of the thesis: Research Question 1.

The first research question therefore revolves around whether there is a theoretical core within the environmental security discourse. The findings indicate that security analyses of environmental issues tend to focus on *either* the level of the state *or* the level of the individual. The environmental analyses that focus on state security emanate from 'traditional' security approaches such as realism and liberalism. Realism's main concerns revolve around aspects such as power balances and interstate conflict in an anarchic international environment where each actor seeks to maximise its own gains in what is believed to be a zero sum game.² On the other hand, liberalism offers more cooperative ways of dealing with environmental problems, focusing on relative rather than absolute gains, trade, economic competition, the liberalisation of markets, liberal institutions, and globalisation.³ Both realism and liberal theory – specifically liberal institutionalism – favour the state as the referent of security.

At the other end of the spectrum, human security focuses on the ways in which environmental insecurity is driven by globalisation and the consumption habits of

² Some central texts espousing these points are: John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York: WW Norton & Co., 2001); Kenneth N. Waltz, *Theory of International Politics* (Long Grove, IL: Waveland Press Inc., 1979); Morgenthau J. Hans, *Politics Among Nations: The struggle for power and peace*, 5th ed. (New York: Knopf, 1978).

³ See for example: Thomas L. Friedman, *The Lexus and the Olive Tree: Understanding Globalization* (London: HarperCollins, 2000). Much of liberal thought in this respect is based on the ideas of Smith. See: Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, ed. W. B. Todd, Glasgow Edition of the Works and Correspondence of Adam Smith (Oxford: Clarendon Press, 1976). Robert M. Axelrod, *The Evolution of Cooperation* (New York: Basic Books, 1984); Robert O. Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy* (Princeton: Princeton University Press, 1984). Michael W. Doyle, "Kant, Liberal Legacies, and Foreign Affairs," *Philosophy & Public Affairs* 12, no. 3 (Summer 1983).

those living in the global North.⁴ Concerns revolve around the basic material needs of individuals and communities and the ways in which poverty and inequity drive vulnerability.⁵ Rather than thinking in terms of an external environment which is to be secured and captured, human security analyses of the environment align with ecological principles that focus on complex and interconnected eco and social systems which, when healthy, help to build resilience – the antithesis of vulnerability.⁶ In the case of human security, the referent of security is obviously individuals and communities.

The specific contribution of this thesis that emanates from answering the first research question is the finding that there is no body of literature that might be considered, in and of itself, to contain the core tenet of environmental security. Nor is there an analytical coherence to environmental security that enables a clear understanding of the interactions between security and the environment. This is a complex claim that will be established by the following literature review chapter and reinforced in Chapter Three. Instead of containing a central theoretical core, environmental security is an amorphous idea that arose over the past few decades from the post-Cold War security discourse interested in the environmental concerns identified above.⁷ This means that environmental security is a conglomeration of ideas from scholars, often from competing disciplines, discussing the ways that environmental processes impact on security. Although there is recognition within the ESS discourse that environmental security does not have a central tenet, nor a united epistemological or methodological approach, there does not appear to be any great consternation about this.⁸

This is potentially a problem, however, in that *environmental security* generally defies definition and is, therefore, a considerably loose term. Answering the first research

⁴ Jon Barnett, *The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era* (London: Zed Books Ltd., 2001); Simon Dalby, *Environmental Security* (Minneapolis: University of Minnesota Press, 2002).

⁵ Karen O'Brien and Jon Barnett, "Global Environmental Change and Human Security," *Annual Review of Environment and Resources* 38(2013).

⁶ Simon Dalby, "Ecological Politics, Violence, and the Theme of Empire," *Global Environmental Politics* 4, no. 2 (May 2004); Simon Dalby, "Ecology, Security, and Change in the Anthropocene," *The Brown Journal of World Affairs* 13, no. 2 (Spring 2007); Barnett, *The Meaning of Environmental Security*.

⁷ Michael Sheehan, *International Security: An Analytical Survey* (Boulder: Lynne Reiner Publishers Inc., 2005).

⁸ Rita Floyd, "Whither Environmental Security Studies? An Afterword," in *Environmental Security: Approaches and Issues*, ed. Rita Floyd and Richard A. Matthew (New York: Routledge, 2013).

question raises the awkward question as to what environmental security actually is. Is it a theory, a field of research, a concept, a discipline, or an analytical framework?⁹ The ambiguous and highly unsatisfactory answer that results from answering research question one, is that environmental security is all of these and none. The challenge of such a disparate approach is that if there is nothing unified about environmental security, and if it is simply a “car crash”¹⁰ of competing ideas and methodologies, then the term *environmental security* could arguably be abandoned given that it fails to provide analytical coherence.

Contribution of the thesis: Research Question 2.

The second research question posed in this thesis therefore asks us to look more deeply and take a more nuanced approach. The assumption driving this approach is that it does *not* follow, given there is no theoretical core to environmental security, that environmental security is a useless term that should be abandoned. Question two therefore asks if it is possible to conceive of environmental security in a more unified way. In the absence of a theoretical core, is there a common theme that runs through the environmental security literature? This is an exploratory research question that highlights the importance of knowing more about this amorphous idea of environmental security. Are scholars on the subject even talking about the same thing given that they are not taking similar methodological or epistemological approaches? If there are similarities, then what are they, and what does this mean?

The research indicates that although the literature on environmental security is disparate in many ways, there is a previously unrecognised and undescribed way of understanding environmental security in a more coherent fashion. Understanding this unifying theme within ESS requires us to ask the important question: What is the referent object of environmental security? Is it the state, individuals or the environment itself?¹¹ What has been found is that although environmental security scholars proceed from a range of theoretical perspectives, each perspective attempts to understand the ways in which security interacts with the environment at

⁹ I owe the excellent framing of this question to Jon Barnett.

¹⁰ I have Dr Matthew Sussex to thank for the ‘car crash’ reference.

¹¹ Simon Dalby, "Environmental Security: Ecology or International Relations?," in *Annual Convention of the International Studies Association* (New Orleans, March, 2002). See also: Karen T. Liftin, "Constructing Environmental Security and Ecological Interdependence," in *Critical Security Studies: Critical Concepts in Military, Strategic and Security Studies*, ed. Columba Peoples and Nick Vaughan-Williams (London: Routledge, 2013), 317.

various social and political levels of analysis. Instead of simply trying to understand the way that the environment interacts with security at only the level of the state, or only the level of the individual, the majority of environmental security scholars endeavour to comprehend the *systemic* impact of environmental processes.

In answering this question, this thesis provides another important contribution, not by acknowledging the splintered theoretical nature of environmental security, but instead, by uncovering the common theme running throughout the literature.

Contribution of the thesis: Research Question 3.

Building on this theme, this thesis forwards a unique approach to environmental security that provides a way of understanding it in a more unified way. This conceptualisation of environmental security is based around its systemic nature – in that it attempts to understand the relationship between states; individuals and communities; and environmental processes and systems. The main argument of this thesis presented here is that rather than the current approaches that suggest that environmental security take *either* a state-centric *or* a human security approach, environmental security must be understood as a combination of both. This approach has been termed “Systemic Environmental Security” (SES). SES is an analytical framework that takes into account the way that environmental processes give rise to both state security *and* human security concerns. From an empirical perspective, SES aligns with ecological notions of the environment due to the emphasis that these give to ecological systems at the local and biospherical levels. Thinking in these terms gives SES a unique advantage in understanding a range of security considerations.

The final research question seeks to understand what, if any, unique insights are provided by SES into the relationship between security and the environment. The final unique contribution of this thesis, therefore, is to empirically explore the potential value of the analytical framework of Systemic Environmental Security. This exploration demonstrates four key insights regarding: the relationships between states and the environment; the relationships between states and other states; the relationship between human security and the environment and; the relationship between the state and human security. Firstly, the attitude of a state to its environmental or renewable resources can have a negative impact on its security

when its resources are viewed in purely economic terms, as sovereign and exploitable. This is related to the second insight that suggests that viewing resources in this way – even when they are shared – can have a negative impact on the relationship between states. SES indicates that the relationships between states which are connected via complex ecological systems, and not simply connected by borders, have unique physical connections that require greater understanding and exploration. Thirdly, the relationship between human security and the environment is particularly strong when individuals and communities are heavily reliant on natural resources for their subsistence and livelihoods. Finally, SES demonstrates that the relationship between the state and human security is not simply based on economic transactions that rely on increasing the revenue for the central government in order to redistribute this to individuals and communities. When environmental resources are valued by states only as a source of economic revenue, without due consideration for their wider importance in the context of ecological and social systems, this can have significant negative impacts on human security.

The Case of the Mekong River Basin

In order to investigate Systemic Environmental Security and draw the conclusions described above, it is crucial to provide an empirical context. This is achieved through a relevant case study which provides both geographic and ecological specificity to the investigation. There are a large number of potentially worthwhile issues to investigate related to environmental security. Each potential research interest is arguably as important as the next, but for the sake of a manageable thesis, only one is focused on here: hydropower construction in the Mekong River Basin (MRB). Hydropower construction in the MRB is occurring in the context of the rapid expansion of hydropower projects throughout Asia and the seemingly unquenchable thirst for energy in the region has pitted energy security against food, water and human security. Large dams have significant impacts on those reliant on the river for their livelihoods and the stability of the wider economy.

There are several good reasons for choosing hydropower as a case study for developing and challenging the idea of Systemic Environmental Security. Firstly, hydropower development works on the assumption that the consequences of fracturing complex riverine ecosystems, and the knock-on effects to environmental

resources, individuals and communities, is acceptable in terms of the economic and societal benefits that flow from the project. This warrants investigation. Secondly, hydropower projects are often highly contested by civil society, frequently pitting governments and private interests against communities and individuals. This provides an opportunity to investigate the interaction between the environment and both state and human security. Finally, given the relevance that hydropower *prima facie* has to the idea of environmental security generally, there is a dearth of case studies on the subject. This thesis will therefore go some way to addressing this lack of attention to hydropower in the environmental security discourse.

Instead of a single nation state, the focus of attention for this thesis will be on a single river system, the MRB. The MRB is of particular interest in that it is currently undergoing a massive expansion in hydropower projects on both the mainstream of the river and its tributaries. Furthermore, the Mekong River is shared by six different nation-states, each treating their part of the river as a national resource to be exploited, with little consideration of the impacts on nations and communities in other parts of the system. This fragmentation of a natural system into artificial political units provides fertile ground for developing the idea of Systemic Environmental Security.

Taking into account the impact of hydropower on both the Mekong mainstream and its tributaries, both a macro and a micro lens will be used to examine the case from an SES standpoint. From a macro perspective, the mainstream dams that have been built in the Chinese section of the river, known as the Lancang Cascade are examined. The Lancang Cascade is having significant environmental, social, economic and political impacts on the MRB, all the way from south-western China to the mouth of the river in the Mekong Delta in Vietnam. This macro perspective gives insight into the relationship between the environmental impacts of hydropower and the state. From a micro perspective, a single dam, the Nam Theun 2 in central Laos, has been selected to provide a more detailed analysis of the impacts of hydropower projects, focussed at the level of the community and individual. By focusing on this single geographic area – the Mekong River Basin – and by narrowing the interest of the thesis to a single security interest – that is, the impact of hydropower development – it is possible to explore the idea of Systemic Environmental Security, asking if and how it is related to this real world problem. It also enables a comparison

of the current ad-hoc and disparate security approaches to hydropower issues in the Mekong River Basin, with an approach that incorporates the state, the individual and the environment.

This narrowed focus highlights the fact that this thesis is not designed to engage, nor capable of adequately engaging with the larger arguments surrounding the biophysical processes of climate change. Neither does it enter into the broad and growing discourse surrounding food and water security. Although issues of food and water are obviously related to human security concerns regarding hydropower – and will be considered in due course – the focus will remain on the literature relevant to environmental security. This is despite both global climate change and food and water security arguably sitting under the general umbrella of environmental security. It is important to keep in mind, however, that the global reach of climate change and the broad applicability of food and water security issues to states and individuals highlight the need for a clear and coherent understanding of the interactions between these environmental challenges and security. The unprecedented global and local environmental changes that have occurred in the past century, and which continue at a rapid pace, in effect, demand a clearer conceptualisation of environmental security. This begins with developing knowledge at a much more specific level. It is intended, therefore, for this thesis to make a significant contribution to the environmental security literature by positing a promising new way of conceptualising the idea in a more coherent fashion, offering a single, complex case-study, which demonstrates its value.

Structuring the Thesis – Linking Theory with Empirics

When undertaking research such as this, it is important to outline and emphasise how the theory is linked with empirics.¹² The structure of this thesis is designed to provide the strongest possible links between theory and the real world.

The literature review chapter – Chapter One – provides an overview of the evolution of the environmental security discourse and outlines the four primary approaches to environmental security: National security; environmental scarcities and violent conflict (ESVC) – including a migration component; critical security; and human security.

¹² Robert K Yin, *Case Study Research: Design and methods* (Thousand Oaks: Sage Publications, 2003), 18, 145.

The methodology chapter, Chapter Two, follows the literature review and has five main goals. It provides: the research design for the thesis – including the research questions and primary assumptions; the thesis scope – explaining and justifying the focus on the Mekong River Basin; an epistemological overview that outlines why a mixed methods approach is used; the case study design; and finally the data collection methods used throughout the thesis. It is intended that a strong methodology will help to guide the research so as to keep the thesis clearly focused on the research questions.

Chapter Three is an extension of the literature review in that it examines the way that the development of the environmental security discourse did not lead to a central tenet with similar methodological and theoretical underpinnings. It goes on to explain that although environmental security is a highly splintered notion, those involved in the discourse nevertheless have similar aspirations in attempting to understand the various security referents and how they interact. From this, the idea of Systemic Environmental Security is explored in more detail and suggested as a way of overcoming the current splintered nature of environmental security studies.

The third section is comprised of the case study chapters which provide an important empirical context in the form of a case study on the Mekong River Basin. The case study chapters provide not only an empirical re-evaluation of the environmental security discourse, but they also afford the opportunity to consider how the empirics relate to the theoretical assumptions of the thesis – specifically Systemic Environmental Security. The first case study chapter, Chapter Four, examines the Lancang Cascade – a series of dams built on the Mekong mainstream in the Chinese section of the river known as the Lancang Jiang. This chapter provides a macro view of the Mekong River Basin and the way that hydropower is interacting with environmental security issues – from the upper section of the river all the way to the Delta. Chapter Five takes a micro view, focusing in on a single dam in Laos, the Nam Theun 2, investigating how it is having an impact on security in a more defined geographical area. Together, these two chapters provide important insights as to why a systemic approach is needed in ESS.

The aim of Section Four, therefore, is to consider the theory of Systemic Environmental Security in the context of the lessons learned from the case study chapters. Chapter Six explores the findings of the case study, concluding that SES provides valuable insight into the links between the state and the environment, states and other states, human security and the environment and, most importantly, states and human security. Finally, the conclusion assesses whether the thesis has been successful in answering the research question and evaluates the potential usefulness of SES to both theory and practice. It concludes by highlighting some of the challenges to SES and also forwards some suggestions for further research that may help to explore, strengthen and challenge the idea of Systemic Environmental Security.

Chapter One: Environmental Security – From National to Human Security

Critics of the idea of environmental security have argued that it is too amorphous.

Michael Sheehan: *International Security*.¹³

Introduction

This chapter sets out to explore the evolution of environmental security and the way that the discourse has evolved from initially being oriented towards national or state security, towards a more human centred focus. This literature review engages with the thesis' first research question regarding the lack of a central premise to environmental security studies (ESS). The chapter will demonstrate that environmental security – as it currently stands – is often simply what occurs when theorists and practitioners, from a range of disciplines within science and social science, attempt to understand the interaction between environmental processes and security concerns.¹⁴ This means that the literature on environmental security is immensely broad, standing at the intersection of politics, geography, economics and a variety of different physical sciences. Obviously a manageable literature review will not be able to adequately review the full spectrum of literature associated with all of the above.

Accordingly, this chapter will review the literature that is important to the evolution of ESS – focusing primarily on those scholars who engage more explicitly with the dominant themes of environmental security. In many ways the literature marries with the evolving nature of international security theory at the end of the cold war and the structure of this chapter will roughly align with this. The first section will review what

¹³ Sheehan, *International Security*, 105.

¹⁴ For a snapshot of this situation see the Millennium Project's overview of environmental security definitions: "Section 2 - Definitions of Environmental Security," *The Millennium Project: Global Futures Studies and Research*, 2014: <http://www.millennium-project.org/millennium/es-2def.html>.

might be considered the “securitisation of the environment”. On one hand, environmentalists sought to push issues related to the environment up the policy chain by embedding environmental issues within the language of security. On the other hand, security scholars sought to broaden the nature of security, moving away from the militaristic mindset that dominated security studies throughout the Cold War. Changes in the environment were usually viewed as a threat to national security, economic prosperity, and the stability of the developing world.

The second phase of environmental security – and the focus of the second section – occurred principally throughout the 1990s and centred mainly on the links between environmental scarcities and violent conflict. This second wave of environmental security studies¹⁵ was a period of empirical exploration investigating the assumptions underlying the statements made about the environment and security in the first wave. An important part of these investigations was the role of migration in creating or encouraging violent conflict. As the majority of the environmental security literature surrounds research into the links between environmental scarcities and violent conflict, a large part of this chapter will be dedicated to exploring this concept – particularly that of the key author of this literature, Thomas Homer-Dixon.¹⁶

The third phase of environmental security was in many ways a response to the second in that much of the literature of this third phase directly challenged the environmental scarcity and violent conflict thesis. The main critiques revolved around the neo-Malthusian assumptions that scarcity is an inevitable result of population growth and that conflict is the most likely outcome of scarcity. The tendency for the environmental scarcity and violent conflict literature to lean towards the national security perspective, focusing on state level analyses rather than other security perspectives, was also criticised. The three most comprehensive critiques of the earlier literature emanate from the disciplines of political ecology, critical security, and human security studies.

¹⁵ Marc A. Levy, "Time for a Third Wave of Environment and Security Scholarship?," in *Environmental Change and Security Program Report* (Washington, DC: Woodrow Wilson International Center for Scholars, 1995).

¹⁶ Richard A. Matthew et al., eds., *Global Environmental Change and Human Security* (Cambridge, Massachusetts: MIT Press, 2010), 10.

Section One: Redefining Security – Making Way for the Environment

The oil shocks of the late 1970s and a growing awareness of human impacts on the environment of disasters such as Chernobyl, Love Canal, and Bhopal created a ground swell of interest in how the environment interacts with security. Books such as *Silent Spring*, *The Population Bomb*, *The Limits to Growth* and Lester Brown's concerns about the limits of the green revolution further encouraged policymakers to give greater consideration to environmental issues.¹⁷ Although a variety of international security scholars demonstrated a keen interest in the links between environmental change and security, for the most part, they lacked the analytical tools for the task.

The realisation that traditional security analyses, focused mainly on military outcomes, were inadequate to deal with complex environmental problems led to calls within security community for a redefinition of security, incorporating issues not usually associated with the dominant realist paradigm.¹⁸ Brown challenged the dominant Cold War military focus of security discourse of the late 1970s, instead linking a nation's security – or lack thereof – with population, hunger, poverty, economic instability and ecological stress: "In a world that is not only ecologically interdependent but economically and politically interdependent as well, the concept of 'national' security is no longer adequate"¹⁹. His belief was that continuing to focus solely on militarisation to the exclusion of development and environmental protection in the Third World would, in the long term, have negative consequences for global security and millions in the poorest countries. As Brown suggests, "neither bloated military budgets nor highly sophisticated weapons systems can halt deforestation or arrest the soil erosion now affecting so many Third World countries. Blocking

¹⁷ Lester R. Brown, "The Next Crisis? Food," *Foreign Policy* 13(Winter 1973-1974); Rachel Carson, *Silent Spring* (London: Ebenezer Baylis and Son Ltd, 1962); Donella H. Matthews, *Limits to Growth* (London: Earth Island Ltd, 1974); Paul R. Ehrlich, *The Population Bomb* (London: Ballantine, 1971).

¹⁸ See for example: Lester R. Brown, "Redefining National Security (1977)," in *Worldwatch Paper 14* (Worldwatch Institute, 1977); Lester R. Brown, "Redefining National Security (1986)," *Challenge* (July/August 1986); Mathews, "Redefining Security."; Richard H. Ullman, "Redefining Security," *International Security* 8, no. 1 (Summer, 1983). Over time, these "new security threats" have come to be known as non-traditional security studies, incorporating not only environmental security, but also energy security, human security, issues surrounding migration and conflict, economic security, cyber security and others.

¹⁹ Lester R. Brown, "Redefining National Security (1978)," *EPA Journal* 4, no. 6 (June 1978): 39.

external aggression may be relatively simple compared with stopping the deterioration of life-support systems”²⁰.

A decade later Jessica Tuchman Mathews echoed Brown’s assessment, calling for a redefinition of security in the face of environmental changes.²¹ Ozone depletion, climate change, population control and refugees figured prominently and the paper has, at its core, an economic argument, representing a liberal institutionalist approach to international security. She encouraged policymakers to factor in the economic benefits of the environment and the related costs of declining environmental services to the world economy. Mathews also suggested that global cooperation and new institutions are required in order to meet the challenges of a globe faced with increased competition for declining resources, but lacking the political nous to do so: “The traditional prerogatives of nation states are poorly matched with the needs for regional cooperation and global decision-making”²².

Similarly, Ullman expressed concern about the “excessively narrow and excessively military” orientation of national security analyses.²³ In his opinion, important potential non-military threats to national security are easily missed due to this blinkered focus on military threats. Ullman’s paper is ground-breaking in that he not only raises concerns about dwindling supplies of essential resources such as fuelwood, fish stocks and clean air and water in the face of increasing demand, but also differentiates between renewable and non-renewable resources.²⁴ He discusses the potentially destabilising effect of large-scale migrations, highlighting the ethnic and religious tensions and social instability that can occur as a consequence.²⁵ Ullman takes the analysis one step further than Brown and Mathews in that he not only asks for a redefinition of security but tentatively provides one:

...a threat to national security is an action or sequence of events that (1) threatens drastically and over a relatively brief span of time to degrade the quality of life for the inhabitants of the state, or (2) threatens significantly to narrow the range of policy

²⁰ Brown, "Redefining National Security (1986)," 32.

²¹ Mathews, "Redefining Security."

²² Mathews, "Redefining Security," 172-73.

²³ Ullman, "Redefining Security," 129.

²⁴ Ullman, "Redefining Security," 140-44.

²⁵ Ullman, "Redefining Security," 142.

choices available to the government of the state or to private, non-governmental entities (persons, groups, corporations) within the state.²⁶

There are clear elements of the social contract within this definition and the state is expanded beyond government institutions and the military with the inclusion of political, economic, and social elements.

Ullman's assessment remains primarily focused on national security and in this way contrasts to the position assumed by Brown and Mathews who are more concerned with transboundary issues and cooperation between states. This is reflective of their different approaches, highlighting Brown's and Mathews' scientific backgrounds and Ullman's international political grounding, reflecting the two sides of the coin that represented environmental security in its early phase. On one side of the coin, actors with environmental, scientific, or economic expertise sought to securitise the problem in order to lift environmental issues up the policy agenda.²⁷ Environmental issues wrapped in the language of insecurity, conflict and negative impacts on national security was targeted at policymakers focused on national security.²⁸ On the other side was the security community, steeped in Cold War realpolitik, attempting to come to terms with a world beyond the bipolarity of the decades preceding the 1990s.

Environmental security issues gained increasing prominence in the mid to late 1980s. In the mid-1980s, for example, former UN Secretary General Boutros Boutros Ghali is famously quoted as saying that: "The next war in the Middle East will be fought over water, not politics"²⁹. Popular international relations magazines began to carry more articles that included an environmental element. In 1986, Norman Myers wrote a securitising piece in *Foreign Policy* linking population growth, resource depletion and social instability. He challenged US policymakers to attempt to come to terms with the complex issues and re-orientate foreign spending towards environmental preservation, asking "(c)ould the time be coming when as much

²⁶ Ullman, "Redefining Security," 133.

²⁷ Barry Buzan, *People States and Fear: An Agenda for International Security Studies in the Post-Cold War Era*, 2nd ed. (Boulder, Colorado: Lynne Rienner Publishers, 1991), 370; Ole Waever, "Security, the Speech Act: Analysing the Politics of a Word," (Copenhagen: Centre of Peace and Conflict Research, June 25-26, 1989).

²⁸ Barnett, *The Meaning of Environmental Security*, 42. For an early example, see: Norman Myers, "The Environmental Dimension to Security Issues," *The Environmentalist* 6, no. 4 (1986).

²⁹ "Former National Leaders: Water a Global Security Issue," *United Nations University*, 20 March, 2011: <http://unu.edu/media-relations/releases/water-called-a-global-security-issue.html>.

lasting security can be purchased through trees as through tanks?”³⁰ The 1987 World Commission on Environment and Development (WCED) Report, *Our Common Future*, provided a form of justification for switching to a focus on environmental security. The report raised the spectre of conflict emanating from disputes over “raw materials, energy supplies, land, river basins, sea passages, and other key environmental resources”³¹ in the face of dwindling supplies and increasing competition. Environmental stress was singled out as an important part of the causal chain in many cases of conflict.

As the Cold War ground to a halt, and the brief period of “the end of history”³² arrived, many who had devoted their lives to Cold War studies and national security searched for new fields of enquiry in what Barnett describes as “the old guard looking for new targets”³³. Former US Secretary of Defence James Schlesinger captured the mood of the time positioning environmental degradation amidst “a plethora of (potential) foreign policy objectives”³⁴ – although from his perspective environmental issues did not rate a serious mention compared with more traditional concerns such as the rise of China and the spread of chemical, biological and nuclear weapons. Despite this, the growing environmental awareness in the security community resulted in organisations such as the US Department of Defence (US DoD) taking note of the shifting security environment and the impacts of environmental changes on its structure and priorities. For example, a 1992 paper specifically mentions the WCED report above, citing concerns over environmental problems amidst a list of 41 “environmental trends” of concern to the US armed forces.³⁵ Even the Secretary of State during the Clinton Administration, Warren Christopher, pointed to the importance of environmental issues to US national security: “The environment has a profound impact on our national interests in two

³⁰ Norman Myers, “Environment and Security,” *Foreign Policy* 74(Spring, 1989): 41.

³¹ Harlem Brundtland, “Our Common Future,” (New York: United Nations World Commission on Environment and Development, 1987).Chapter 11/2.

³² Francis Fukuyama, *The End of History and the Last Man* (Avon Books Inc.: The Free Press, 1992).

³³ Jon Barnett, “New Security Issues: The Old Guard Looks for New Targets,” in *The Meaning of Environmental Security* (London: Zed Books Ltd., 2001).

³⁴ James Schlesinger, “Quest for a Post-Cold War Foreign Policy,” *Foreign Affairs* 72, no. 1 (1992): 18. This state of affairs has also been referred to as ‘Mandelbaum’s doughnut’, after former Clinton adviser Michael Mandelbaum said, “We have a foreign policy today in the shape of a doughnut – lots of peripheral interests but nothing at the centre.” See: Robert D. Kaplan, “The Coming Anarchy,” *The Atlantic*(February 1994), <http://www.theatlantic.com/magazine/archive/1994/02/the-coming-anarchy/304670/>.

³⁵ Robert Jarrett et al., “Environmental Trends: Policy Implications for the U.S. Army,” (Champaign, Illinois: Army Environmental Policy Institute, March 1992), 9.

ways...First, environmental forces transcend borders and oceans to threaten directly the health, prosperity and jobs of American citizens. Second, addressing natural resource issues is frequently critical to achieving political and economic stability, and to pursuing our strategic goals around the world"³⁶. This is a clear manifestation of the securitisation of the environment at the highest level of international politics.

Kaplan's alarmingly worded *The Coming Anarchy*, continued the trend of securitising the environment. The environment, according to Kaplan, is not only a national security concern, but also something to be feared: "The environment...is part of a terrifying array of problems that will define a new threat to our security"³⁷. Kaplan paints a world of food and water shortages, violent upheaval, state failure, and – as the name of the article suggests – general anarchy in which "(e)nvironmental scarcity will inflame existing hatreds and affect power relationships". In his estimation, environmental threats will be the foreign policy challenges of the future:

It is time to understand The Environment for what it is: the national-security issue of the early twenty-first century. The political and strategic impact of surging populations, spreading disease, deforestation and soil erosion, water depletion, air pollution, and, possibly, rising sea levels in critical, overcrowded regions like the Nile Delta and Bangladesh – developments that will prompt mass migrations and, in turn, incite group conflicts – will be the core foreign policy challenge from which most others will ultimately emanate, arousing the public and uniting assorted interests left over from the Cold War.³⁸

Kaplan's imagery indicates that the environment is clearly something to be feared due to the havoc that it will wreak and the danger it presents to national security. His concerns were echoed several years later by Klare who posits that the wars of the future will be fought primarily over dwindling natural resources including water and timber, although his main concerns centred on non-renewable resources such as oil and gas.³⁹ Instead of a world divided along ethnic, ideological and nationalist lines, in Klare's opinion, the world of the future will be split up into geopolitical zones of

³⁶ "Christopher Challenges Academia to Aid in Environmental Initiative,"(11 April, 1996), <http://news.stanford.edu/pr/96/960412chrstopher.html>.

³⁷ Kaplan, "The Coming Anarchy."

³⁸ Kaplan, "The Coming Anarchy."

³⁹ See: Michael T. Klare, "The New Geography of Conflict," *Foreign Affairs* 80, no. 3 (May, 2001); Michael T. Klare, *Resource Wars* (New York: Owl Books, 2001).

conflict over dwindling resources of oil and gas, water systems and aquifers, and gems, minerals and timber.⁴⁰

The assumptions within this discourse is that scarcities of resources lead to conflict, chaos and anarchy, and that the ensuing instability in the South threatens the stability and prosperity of the North. In both of these analyses there is a strong neo-Malthusian element. Although the Reverend Thomas Malthus wrote his *Essay on the Principle of Population* in 1798,⁴¹ the concerns that he raised about the capacity of the earth to provide food and water to ever-growing populations witnessed a resurgence prior to and following the green revolution of the 1960s and 1970s.⁴² This was not only limited to foreign policy analysts and traditional security scholars, but also extended into the environmental and scientific community. In fact much of Brown's work and his publications through the Worldwatch Institute have been, and remain unapologetically neo-Malthusian.⁴³ Although neo-Malthusian analyses tend to be more nuanced, complex, and technical than Malthus's original work, the central idea remains that, at some point, given continual population growth, a limit to the carrying capacity of the earth and its ecosystems must be reached.⁴⁴ This theme underpins much of the environmental security literature because it is assumed that once carrying capacity is reached, people will fight for those ever dwindling resources. This in turn tends towards a more nationalistic security orientation. In some respects, this basic assumption also underpins a great deal of anxiety and foreboding that accompanies more modern discussions about food and water shortages.

John Orme's article is particularly telling in regards to the perceived links between neo-Malthusian views of resource scarcity and conflict. Orme's strongly realist account links the peace and prosperity since the Second World War with man's

⁴⁰ Klare, "The New Geography of Conflict," 55. See also: Klare, *Resource Wars*, 213-14.

⁴¹ Rev Thomas Robert Malthus, *An Essay on the Principle of Population* (New York: Augustus M. Kelly Publishing, 1971).

⁴² See for example: Fairfield Osborn, ed. *Our Crowded Planet: Essays on the Pressures of Population* (London: Allen & Unwin, Ltd., 1962); Michael Kile, *No Room at Nature's Mighty Feast: Reflections on the Growth of Humankind* (East Perth: Demos Press, 1995); Ehrlich, *The Population Bomb*.

⁴³ Lester R. Brown, Gary Gardner, and Brian Halweil, "Beyond Malthus: Nineteen Dimensions of the Population Challenge," in *The Worldwatch Environmental Alert Series*, ed. Linda Starke (London: Earthscan Publications Ltd., 2000).

⁴⁴ A detailed anthropological analysis on the subject can be found in: Jared Diamond, *Collapse: How Societies Choose to Fail or Survive* (London: Penguin, 2006). Of particular relevance to carrying capacity is Chapter 2: Twilight at Easter.

“conquest of nature”⁴⁵. Accordingly, “(t)here is only so much fresh water on the planet, and hence there must eventually be a limit to the amount food (sic) available to nourish the human species”⁴⁶. He therefore postulates:

When the empire of man over nature can no longer be easily extended, then the only way for one people to increase its standard of living is by redistributing the sources of fruits of industry from others to themselves. The surest way to do so is by extending man’s empire over man... As the value of land increases, so too does the value of the primary means of taking and holding it: diminishing returns in the economy implies increasing returns to the military.⁴⁷

This is a Hobbesian equation, according to Orme, who believes that conflict is inevitable when “two men desire the same thing, which nevertheless they cannot both enjoy”⁴⁸. The potential for cooperation in the face of a world of increasing scarcity does not rate a mention in Orme’s article. States facing these conditions instead either “collapse into chaos” or “channel the discontent... (towards) foreign aggression”⁴⁹.

Orme argues from a strongly realist position based on neo-Malthusianism assumptions about resource scarcity. Although his views are more radical than other national security arguments in that he assumes that conflict necessarily follows from severe resource scarcity, his epistemological approach is nevertheless similar to much of the early literature on environmental security: Nature, or the environment, is a source of threat to the nation state which must protect itself through a range of policy measures taken at the national level. These include an increase in foreign aid, Third World interventions, vague suggestions about how to improve the global environment and a hedging against the violence and aggression which is likely to emanate from the economically and resource poor countries of the global South.

The majority of the literature in this first wave of environmental security is built on the assumption that environmental scarcities will lead to violence and/or chaos – at both the international and sub-national levels. What is also present in the majority of the

⁴⁵ John Orme, "The Utility of Force in a World of Scarcity," *International Security* 22, no. 3 (Winter, 1997-1998): 159.

⁴⁶ Orme, "The Utility of Force," 166.

⁴⁷ Orme, "The Utility of Force," 165.

⁴⁸ Orme, "The Utility of Force," 166.

⁴⁹ Orme, "The Utility of Force," 159.

literature is an attempt to understand the way that security and the environment interact in a more complex and inclusive way that pushes the boundaries of well-established scientific and social scientific epistemological siloes. The second wave of environmental security literature, reviewed below, took these neo-Malthusian assumptions surrounding resource scarcity and violent conflict and tested them through detailed case-studies whilst developing complex causal models.

Section Two: Violence, Conflict and the Environment

Homer Dixon and the ECAC Project

By the early 1990s it was clear that environmental issues were gradually forming an important part of the security landscape. As has been demonstrated above, much of this literature was still steeped in traditional analyses that attempted to come to terms with the complexities of environmental issues. At the same time, many analyses were vague and/or anecdotal. Several large projects were undertaken throughout the 1990s to empirically investigate the links between security and the environment. Baechler's *Environment and Conflicts Project* (ENCOP) brought together sixty experts from seventeen nations in order to study the relationship between environmental change and violent conflict.⁵⁰ The findings of the project indicated that "apocalyptic scenarios" and "alarmist prognoses of world environmental wars" were untenable.⁵¹ As a result, Baechler suggested that a more nuanced understanding of the relationship between the environment and conflict was needed:

Human-induced environmental change can be either a contributing or a necessary factor to both the emergence and/or the intensification of violent conflicts. On one hand, violent conflicts triggered by environmental disruption are due in part to socioeconomic and political developments. On the other hand, social and political maldevelopment, due in part to degradation of natural resources, has become an international peace and security challenge.⁵²

⁵⁰ "Environmental Crisis: Regional Conflicts and Ways of Cooperation," in *Environment and Conflicts Project (ENCOP) Occasional Paper Series*, ed. Kurt R. Spillman and Gunther Baechler (Zurich: Center for Security Studies and Conflict Research, September, 1995).

⁵¹ Günther Baechler, "Why Environmental Transformation Causes Violence: A Synthesis," in *Environmental Change and Security Project Report* (Washington DC: Woodrow Wilson International Center for Scholars, Spring 1998), 24.

⁵² Baechler, "Why Environmental Transformation Causes Violence", 24.

These observations challenged the national security mindset that assumed that violent conflict would naturally stem from environmental scarcities and environmental change. They were also important in that they also highlighted that negative outcomes in relation to the environment do not only occur due to a changing environment, but can also be driven by the behaviour of states (political development).

Of far greater influence than Baechler has been Thomas Homer-Dixon, who in 1991 set out a new research agenda for environmental security. *On the Threshold* appeared in the security journal *International Security* and raised a number of challenges to the environmental security discourse of the time.⁵³ The ideas outlined in *On the Threshold* established the theoretical foundation and epistemological assumptions that underpinned the series of case studies that lead to the development his theoretical framework as outlined in *Environmental Scarcities and Violent Conflict*.⁵⁴ This second article was the summation of a three year project on Environmental Change and Acute Conflict (ECAC) under the auspice of the Peace and Conflict Studies Program at the University of Toronto, bringing together thirty researchers from ten countries.⁵⁵

The aim of the ECAC project was to empirically explore the three “ideal types” of conflict surrounding environmental scarcities, also outlined in the initial document. First – that environmental scarcities lead to interstate “simple-scarcity” conflicts or resource wars; second – that environmental scarcity can induce large population movements which then provoke “group-identity” conflicts such as ethnic clashes and thirdly; severe environmental scarcity simultaneously increases economic deprivation and disrupts key social institutions, which in turn lead to “deprivation” conflicts such as civil strife and insurgency (see figure 1).⁵⁶ For each of these hypotheses, two case studies were completed and in each case the aim was to

⁵³ Thomas F. Homer-Dixon, "On the Threshold: Environmental Changes as Causes of Acute Conflict," *International Security* 16, no. 2 (Fall, 1991).

⁵⁴ Thomas F. Homer-Dixon, "Environmental Scarcities and Violent Conflict: Evidence from Cases," *International Security* 19, no. 1 (1994).

⁵⁵ Thomas F. Homer-Dixon, "Environmental Scarcities and Violent Conflict: Evidence from Cases," *International Security* 19, no. 1 (Summer, 1994): 5.

⁵⁶ Homer-Dixon, "Environmental Scarcities," 6-7.

falsify the null hypothesis that “environmental scarcity does not cause violent conflict”⁵⁷.



Figure 1: Homer-Dixon's 'Ideal Types' of Conflict

For stronger internal validity, the causes of environmental scarcity were defined and limited to three sources: Environmental change; population growth; and the unequal distribution of resources. In regards to the first, environmental change, it was defined as “a human induced decline in the quantity or quality of a renewable resource that occurs faster than it is renewed by natural processes”⁵⁸. This was further broken into six possibly relevant types of environmental change linked to renewable resources: degradation and loss of agricultural land; degradation and removal of forests; depletion and pollution of fresh water supplies; depletion of fisheries; greenhouse induced climate change and; stratospheric ozone depletion. Climate change and ozone depletion were omitted as types of environmental change to be investigated for the project. The logic behind this was simply that the developing world is *already* suffering from the large scale impacts of environmental change and, although climate change is likely to impact on developing countries increasingly over the 21st century, the priority for research on conflict and the environment should be focused

⁵⁷ Homer-Dixon, "Environmental Scarcities," 7.

⁵⁸ Homer-Dixon, "Environmental Scarcities," 7.

on what is currently occurring. He also points out that climate change (“atmospheric problems”) will interact with events that are already taking place.⁵⁹

The second cause of environmental change – population growth – is much more straightforward. The effect of population growth on resource scarcity is that it reduces a resource’s per-capita availability by dividing it between more and more people. It can often have a double impact in that population growth can also contribute to environmental change by decreasing the quantity or quality of renewable resources in areas surrounding the growing population.⁶⁰ There is certainly a strong neo-Malthusian element here, indicating an assumption that population growth leads to resource scarcity once the carrying capacity is reached.

The final cause of environmental change according to Homer-Dixon is the unequal distribution of resources: “(A)nalysts often study resource depletion and population growth in isolation from the political economy of resource distribution”⁶¹. The unequal distribution of resources concentrates a resource in the hands of a few people and therefore subjects the rest of a given population to greater scarcity. This point is of the most interest to this thesis focused on hydropower construction.

These three sources of environmental scarcity each have a varying effect on the ‘resource pie’. Environmental change reduces the quantity and quality of the pie, while population growth divides it into smaller pieces, and unequal resource distribution means that some get a much larger slice, leaving less for everyone else. When these sources of environmental scarcity interact with each other, two patterns are particularly common: “resource capture and “ecological marginalisation” (see Figure 1).⁶² Resource capture occurs when a fall in the quantity and quality of renewable resources combines with population growth and encourages powerful groups within society to shift resource distribution in their favour. Ecological marginalisation can occur when unequal resource access and population growth occur resulting in migration to regions that are ecologically fragile such as upland

⁵⁹ Indeed, in the two decades since this article was written the world has added over a billion to its population and the pace of environmental change and resource scarcity has only increased. There is little doubt that the effects of climate change are beginning to be felt around the globe, however Homer-Dixon’s argument that climate change interacts with environmental scarcity remains relevant today.

⁶⁰ See footnote in: Homer-Dixon, “Environmental Scarcities,” 9.

⁶¹ Homer-Dixon, “Environmental Scarcities,” 8-9.

⁶² Homer-Dixon, “Environmental Scarcities,” 10.

slopes, areas at risk from desertification, and tropical rain forests. Large populations in these marginal areas can cause severe environmental damage and chronic poverty.

The complexity of Homer-Dixon's framework is evident. As will be demonstrated below, this provides opportunity for strong criticism. Whether the theoretical framework is overly complex or not, what is clear is that Homer-Dixon is attempting to come to terms with the complexity of the real world that researchers interested in the links between the environment and social outcomes encounter frequently. The complexity of the framework is understandably mirrored by the complexity of the results. The case studies undertaken by the ECAC project called into question the first hypothesis finding little empirical evidence to support the assumption that renewable resource scarcity creates "simple-scarcity" conflict between states. Water was found to be the one renewable resource with the capacity to create interstate conflict because it is crucial for both human and national security, as well as survival.

With regards to the second hypothesis, the ECAC project found that "there is substantial evidence to support the hypothesis that environmental scarcity causes large population movements, which in turn causes group identity conflicts"⁶³. The most well developed example given concerning conflict brought about by large population movements as a result of environmental scarcity is the tension between India and Bangladesh that has arisen due to the large migrations from Bangladesh to India. Environmental scarcity in Bangladesh caused by environmental change, population growth and the unequal distribution of resources created a situation that precipitated large scale migration: "The absence of any hope of survival in other parts of their own country has left no other option for them but to cross the porous border into India"⁶⁴. Once in the receiving area, ethnic, religious and indigenous 'nativism' combined to create tensions between migrants and the original inhabitants. As tensions grew, migrant groups and indigenous groups became more organised, and politically motivated individuals and groups realised that it may be in their interest to align themselves with either bloc. Other native groups such as the Hindu 'Army of Shivaji' took it upon themselves to resort to violence and murder in an

⁶³ Homer-Dixon, "Environmental Scarcities." 20.

⁶⁴ Ashok Swain, "Displacing the Conflict: Environmental Destruction in Bangladesh and Ethnic Conflict in India," *Journal of Peace Research* 33, no. 2 (May 1996). 194.

attempt to expel the Muslim Bangladeshis.⁶⁵ Obviously, the chain of events linking environmental scarcity with migration and violent conflict is a complex process. Given the importance of migration to the environmental scarcity and conflict thesis, and the complexity involved, the following section will discuss this issue in greater detail.

The final hypothesis considered by the ECAC project was in regards to “deprivation conflicts”. The project found that empirical evidence partially supports the hypothesis that environmental scarcity simultaneously increases economic deprivation and disrupts key social institutions.⁶⁶ Whether or not this occurs is due to a variety of contextual factors. The most important issue at play and the biggest risk factor was the failure or disruption of the social institution of the state. Environmental scarcity creating large population movements and economic decline appears likely to sharply weaken the capacity and legitimacy of the state in some poor countries.⁶⁷ The effect of resource scarcity combined with decreased economic activity decreases the revenues available to local and national governments. In what could be described as a downward spiral, this decreases the ability of the state to in turn respond to the environmental scarcity and can have the impact of increasing environmental scarcity due to growing poverty and unemployment. Key contextual factors are obviously important in determining whether these will lead to deprivation conflicts. Civil strife is more likely when pressures interact to create an increase in *grievance* and *opportunity*.

The ideas of grievance and opportunity reflect the notion that there is no clear correlation between poverty and social conflict. That is to say, it does not follow that the fact that a person lives in poverty will lead to them having a grievance against the system or state that either led to or fails to remedy the situation of poverty. Much depends on the subjective ‘blame system’ of the actors involved.⁶⁸ Cultures that are fatalistic about their economic situation are less prone to violence. This gives rise to the idea of ‘relative deprivation’.⁶⁹ Simply taking GDP per capita and education levels

⁶⁵ Swain, "Displacing the Conflict." 200.

⁶⁶ Homer-Dixon, "Environmental Scarcities." 24.

⁶⁷ Homer-Dixon, "Environmental Scarcities." 25.

⁶⁸ Homer-Dixon, "Environmental Scarcities," 26.

⁶⁹ For more on relative deprivation, see: Ted Robert Gurr, *Why Men Rebel* (Princeton, N.J.: Princeton University Press, 1970).

as indicators of grievance – and therefore the potential for civil strife – is far too simplistic. Relative deprivation relates to the gap between a person's level of satisfaction and their perceived notion of what they believe they actually deserve.⁷⁰ This is an important notion as it indicates that the likelihood of poverty related to civil strife in any given society is contingent on the systems of belief that are held by those in poverty. This means that someone living in much better circumstances – according to standard economic indicators – may well be more prone to violent conflict than someone who is living in abject poverty due to the fact that they subjectively perceive their circumstances as worse than what they actually deserve. This leads to a feeling of grievance which they are more likely to act upon than the person in a worse situation who sees no reason for grievance, and therefore action.

Once again, contextual factors are important and the more an individual feels connected to a group with the same belief system, the more likely they are to express grievance. This point is explored in more detail by Kahl, below. If groups are organised around ethnic, religious or class values and belief systems, and are able to articulate and coordinate through well organised and financed opposition groups, they will have greater relative power. Homer-Dixon points out that “(t)hese groups can provide a clear sense of identity and act as nuclei around which highly mobilized and angry elements of the population, such as unemployed and urbanised young men, will coalesce. Conversely, if economic crisis weakens challenger groups more than the state, or affects mainly disorganised people, it will not lead to state violence”⁷¹.

Opportunity can arise through a variety of sources. A weakened state obviously presents opportunities for challengers such as elite groups with a grievance to make a move against the state or state control. Remoteness also presents opportunity. The ECAC project examined the Sendero Luminoso rebellion in Peru which resulted from a series of land re-distributions, population growth, soil degradation and drought.⁷² The heart of the rebellion was in the physically remote city of Ayacucho which also has a major university that served as an organisational base for radicals. Graduates of the university were less likely to gain professional jobs on graduation

⁷⁰ Homer-Dixon, "Environmental Scarcities." 26.

⁷¹ Homer-Dixon, "Environmental Scarcities." 27.

⁷² Homer-Dixon, "Environmental Scarcities." 30-31.

and therefore joined the ranks of mobile, angry disgruntled citizens. This led to both grievance *and* the opportunity to act on those grievances which played a part in the rebellion.

Homer-Dixon summarises the 1994 article confidently: “Our research shows that environmental scarcity causes violent conflict”⁷³, a position from which he subsequently backed away from, being more careful to demonstrate complex causality. For example, in *Ecoviolence*, which Homer-Dixon co-edits with Jessica Blitt, they conclude that “severe environmental scarcities often contribute to major civil violence”⁷⁴. *Ecoviolence* summarises the Project on Environment, Population, and Security (EPS) which examined a further five case studies on the links between environmental scarcities and violent conflict. Chapter six, “The Case of Rwanda”, is a particularly interesting examination of the links between environmental scarcities and violence in the Rwandan conflict of 1994.⁷⁵ The complexity of the causal links between environmental scarcities and violence is highlighted in that both the independent and dependent variables were strong in this case, given that both environmental scarcity and violent conflict were present. What is significant, however, is that the conclusion is drawn that the connections between the two were not particularly strong. Scarcity and violent conflict coexisted but the causal links between the two were “difficult to determine”⁷⁶.

The other cases examined in the book – the Zapatistas rebellion in Chiapas, Mexico; water scarcity and population growth in Gaza; environmental scarcity in apartheid South Africa; and population growth and structural scarcity in Pakistan in the mid-90s – all paint a picture of the complex interaction between environmental scarcities and violent conflict, highlighting important causal links without drawing strong causal conclusions. In a book written after *Ecoviolence* but referring back to the ECAC project, Homer-Dixon demonstrates how far he has moved from his earlier confident position:

⁷³ Homer-Dixon, "Environmental Scarcities."

⁷⁴ Thomas Homer-Dixon and Jessica Blitt, eds., *Ecoviolence: Links Among Environment, Population, and Security* (Lanham, Maryland: Rowman and Littlefield, 1998), 15.

⁷⁵ This chapter also appeared as a separate article: Thomas Homer-Dixon and Val Percival, "Environmental Scarcity and Violent Conflict: The Case of Rwanda," *The Journal of Environmental and Development* 5(1996).

⁷⁶ Homer-Dixon and Percival, "The Case of Rwanda," 288.

(P)reliminary research indicates that scarcity of renewable resources – or what I call environmental scarcity – can contribute to civil violence, including insurgencies and ethnic clashes... Scarcity's role in such violence, however, is often obscure and indirect. It interacts with political, economic, and other factors to generate harsh social effects that in turn help reduce violence. Analysts often interpret the social effects as the conflict's principal causes, thus overlooking scarcities' influence as an underlying stress.⁷⁷

In the final section, critiques of Homer-Dixon's position on the role of environmental scarcities in contributing to violent conflict are examined, and it is worth noting here, and important to keep in mind that it is a complex, rather than simple, relationship that Homer-Dixon posits.

Homer-Dixon's work, and that of the ECAC and EPS projects, appears in a variety of other settings,⁷⁸ and spurred on a mixture of research and critiques. An important addition to the literature on environmental scarcities and conflict is that of Colin Kahl who first outlined his argument in 1998.⁷⁹ Kahl set out to explore the linkages between what he refers to as "demographic and environmental stress (DES)... a composite variable encompassing: (1) population growth and (2) the degradation, depletion, and maldistribution of renewable resources" and civil strife.⁸⁰ He furthers the work of previous scholars on the subject by adding *state exploitation* to the *deprivation* and *state weakness* arguments, as outlined above. In his opinion the causal role of the state in cases of DES and violence has been undertheorised.⁸¹

Kahl refers to first order and second order effects of DES. First order effects are already familiar to those involved in the environmental scarcity and violent conflict debate: renewable resource scarcity; economic marginalisation (poverty or resource capture); and demographic shifts – including population growth, urbanisation and

⁷⁷ Thomas Homer-Dixon, *Environment, Scarcity, and Violence* (Princeton: Princeton University Press, 1999), 177.

⁷⁸ See for example: Nils Petter Gleditsch, "Conflict and the Environment," in *NATO ASI series* (Dordrecht: NATO, 1997); Daniel H. Deudney and Richard A. Matthew, eds., *Contested Grounds* (New York: State University of New York Press, 1999).

⁷⁹ Colin H. Kahl, "Population Growth, Environmental Degradation, and State-Sponsored Violence: The Case of Kenya, 1991-93," *International Security* 23, no. 2 (Fall, 1998). Kahl's framework is further elaborated in: Colin H. Kahl, *States, Scarcity, and Civil Strife in the Developing World* (Princeton: Princeton University Press, 2006).

⁸⁰ Kahl, "The Case of Kenya," 82.

⁸¹ Kahl, "The Case of Kenya," 84.

“youth bulges”.⁸² Second order effects are related to the grievances which occur in society as a result of DES. As a result of relative deprivation these grievances may be directed at the state or other groups, such as elites, who are blamed for the DES or are a cause of resentment because of their inequitable gains. These grievances act as threats to the regime, and, Kahl believes, they may be co-opted by the state in order to divert attention from state or elite activity. “Most obviously, inciting intergroup violence can be a brutally effective way of crushing political opponents. Less obvious, but no less important, violence can divert attention away from a regime’s failings while making key social groups dependent upon the state for their physical well-being, thereby ensuring their allegiance”⁸³.

Two intervening variables between DES and state exploitation are also identified. The first is inclusive institutions which act to empower key social groups, enabling them to participate in and influence the decision making of state elites. Inclusive institutions hinder the ability of state elites to co-opt the grievances caused by DES. The corollary, exclusive states, enables elites to exploit these grievances and direct them towards other less favoured groups.

The second intervening variable identified is what Kahl refers to as “groupness” – or the degree of societal segmentation in any given state. “Homogenous societies dominated by a single group identity, and heterogeneous societies with significant cross cutting group affiliations and interests are characterised by low segmentation and thus low groupness”⁸⁴ – therefore decreasing the likelihood of state elites being able to direct grievances regarding DES at other groups. Higher groupness increases the risks of state exploitation by providing an atmosphere of inbuilt tensions and high societal segmentation, lowering the costs for elites of instigating violence between groups.

Kahl demonstrates how state exploitation of DES occurred in Kenya in the early 90s where rapid population growth and increasing land scarcity combined with poverty and urbanisation to create the perfect environment for state exploitation. Long-standing inter-ethnic grievances between Kalenjins – led by President Moi – and

⁸² Kahl, "The Case of Kenya," 84-86.

⁸³ Kahl, "The Case of Kenya," 88.

⁸⁴ Kahl, "The Case of Kenya," 91.

other ethnic minorities in Kenya were inflamed deliberately by the president in order to divert attention from the state's role in the land crisis. This led to the death of thousands and displacement of hundreds of thousands. Kahl warns that the case of Kenya demonstrates that DES poses a serious threat to political stability in the developing world: "states need not totally collapse for population growth and environmental pressures to produce violent internal conflicts; violence can also result from the purposive actions of state elites"⁸⁵.

The work carried out by Kahl, Homer-Dixon, members of the Environmental Change and Conflict project and those involved with the Environment, Population and Security project moved the environmental security literature from the speculative towards a model of the environment and conflict based on empirical observation. This empirical rigour brought greater credibility to the idea of environmental security which, in turn, helped capture public and policy attention – ironically, often through the re-interpretation of the research and journalistic flair of writers such as Kaplan. The epistemology remained neo-Malthusian – given the focus on resource scarcities – but the security dimension shifted from one purely focused on national security, towards a more nuanced understanding of the relationship between the state, communities, institutions, population, the environment and conflict.

Rather than simply thinking of security in terms of a binary relationship between the state and the environment – based on realist assumptions – the work undertaken during this second phase of environmental security expanded the notion of security to impacts at the sub-state level. An element of violent conflict was required to register an issue as a security concern which discounted non-violent conflict and non-conflictual violence as issues for consideration. Nevertheless, the incorporation of individuals, communities and institutions and the ways in which they are impacted by environmental scarcities, contribution to our understanding of environmental security in important ways. Of particular relevance to this thesis is the more systemic perspective that was brought to bear on the relationship between the environment and security.

⁸⁵ Kahl, "The Case of Kenya," 118.

Population Movement and Environmental Security

Much of the literature on environment and security hinges on the linkages between environmental change and migration. Homer-Dixon's framework indicates that when environmental scarcities occur, population movements often result which, in turn, can lead to civil strife and ethnic conflict. Homer-Dixon discusses the influence of 'push' and 'pull' factors in migration decisions. He suggests that what distinguishes a migrant from a refugee is the weight of the push or the pull factor, with refugees normally being pushed or forced to relocate. He finds that "(e)nvironmental scarcity is more likely to produce migrants than refugees, because it usually develops gradually...and...pull factors can therefore clearly enter into potential migrants calculations"⁸⁶. These 'environmental migrants' are often poor and politically weak and may remain so in the receiving society. Homer-Dixon notes that without the backing of a state – receiving or sending – it is unlikely that migrants are able to organise, gain power and create conflict.⁸⁷ In this case migration is "less likely to produce violence than silent misery and death"⁸⁸.

This indicates that understanding the interaction between environmental processes and migration is an important element in understanding environmental security. The ECAC project was not by any means the first to draw these links, and there is a strong body of literature both within and at the periphery of the environmental security discourse that debates the role of population movement as a result of environmental change and as a cause of violent conflict. This section will briefly overview this important element of the environmental security literature as it relates to population movement, focusing on three main themes: the legal status of those who are or will be affected by environmental changes; the types of environmental changes that are causing or encouraging people to move; and the impacts of these environmentally induced migrations on security.

Migration has been a constant factor of human civilisation and the environment has frequently been part of this equation. A large variety of natural and climate disasters over the past few thousand years have forced countless people to move from their

⁸⁶ Homer-Dixon, "Environmental Scarcities." 20.

⁸⁷ Homer-Dixon, "Environmental Scarcities." 20-21.

⁸⁸ Homer-Dixon, "Environmental Scarcities." 21.

places of residence to different, more hospitable areas.⁸⁹ More recently, as the interest that developed over the last few decades grew in regards to the linkages between the environment and security, so has the interest in the links between security and migration. Of particular relevance to this thesis is the developing body of research focused on the same environmental factors that gave birth to the environmental security discourse – such as resource scarcity, population growth, food and water shortages and climate change. Academic and policy interests surrounding the links between the environment and migration initially centred on the concept of “environmental refugees”. This is a highly contested term that initially entered the public sphere in 1985 after El Hinnawi, a researcher at the United Nations Environmental Program (UNEP), classified environmental refugees as “those people who have been forced to leave their traditional habitat, temporarily or permanently, because of marked environmental disruption (natural and/or triggered by people) that jeopardised their existence and/or seriously affected the quality of their life”⁹⁰.

According to the United Nations High Commissioner for Refugees (UNHCR), however a refugee is defined as a person who has a “well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion”⁹¹. This very specific definition prevents any recognition under international law of a person seeking refuge from environmental catastrophe or change without the accompanying fear of political persecution necessary to include them in UNHCR’s description. Furthermore, a refugee must be “outside the country of his nationality (and)... is unable or, owing to such fear, is unwilling to return to it”. Very often, a person who is popularly conceived of as an environmental refugee remains within the borders of their own country, further impeding them from any official international status.⁹² The International Organisation

⁸⁹ Some historic and more commonly understood examples of disasters forcing migration are volcanoes, drought and resource depletion. See: J.R. McNeill and Erin Stewart Mauldin, *A Companion to Global Environmental History*, Blackwell Companions to World History (Chicester2012); Diamond, *Collapse*.

⁹⁰ El-Hinnawi found in: Diane C. Bates, "Environmental Refugees? Classifying Human Migrations Caused by Environmental Change," *Population and Environment* 23, no. 5 (May 2002)., 466.

⁹¹ General Assembly United-Nations, "Convention Relating to the Status of Refugees," *United Nations Treaty Series* 189(28 July 1951).

⁹² This definition apparently gives UNHCR the monopoly on the definition of a refugee and this fact is little criticised in the literature. For a discussion of the structural genesis and challenges to adaptation of the UNHCR see: Howard Adelman, "From Refugees to Forced Migration: The UNHCR and Human Security," *The International Migration Review* 35, no. 1 (2001).

for Migration (IOM) and others have classified such people as ‘Internally Displaced People’ or IDPs, but have placed very little emphasis on the environment in their definition.⁹³ Vlachos suggests that a way of overcoming the IDP versus refugee problem is to use the dual terms ‘environmental refugees’ and ‘eco-migrants’.⁹⁴

The difficulty in establishing who exactly constitutes an environmental refugee has led to criticism of the term and those who use it. At the forefront of this criticism is Richard Black, who believes the term ‘environmental refugee’ is “unsound intellectually”⁹⁵. He observes that the decision to migrate or flee from a particular area is usually the consequence of a variety of push and pull factors and cannot be readily attributed to one single environmental cause.⁹⁶ Indeed, migration is a complex issue and the decision can be made at an individual, familial or community level for a variety of reasons. Even so, a recent report by the Environmental Change and Forced Migration Scenarios (EACH-FOR) Project indicated that the environment is increasingly playing an important role as a push factor or ‘signal’ in migration decisions, emphasising the role of the environment amongst the other factors that influence migration decisions.⁹⁷

Bates describes the decision-making process as a “continuum” from those that have total control over the decision, to those having no control. In her opinion, involuntarily migrants such as those effected by sea-level rise, are to be considered ‘environmental refugees’; those who are compelled by “the transformation of the environment to one less suitable for human occupation”,⁹⁸ receive the ‘environmental migrants’ categorisation; and those who leave of their own volition – migrants. Lee agrees, suggesting that there is a difference between environmental migrants and

⁹³ According to the IOM, IDP’s are: “persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized state border.”: International Organisation for Migration, "Internally Displaced Persons," <http://www.iom.int/jahia/Jahia/about-migration/developing-migration-policy/migration-displacement/internally-displaced-persons/cache/offonce>. Accessed 25 March 2009

⁹⁴ Evan Vlachos, "Environmental Refugees: The Growing Challenge," in *Conflict and the Environment*, ed. Nils Petter Gleditsch (Dordrecht: NATO, 1997), 295.

⁹⁵ Richard Black, "Environmental Refugees: Myth or reality?," in *New Issues in Refugee Research* (Working Paper No. 34: UNHCR, March 2001).

⁹⁶ Black, "Environmental Refugees: Myth or reality?." 11

⁹⁷ Koko Warner et al., "Human Security, Climate Change and Environmentally Induced Migration," (Bonn: United Nations University - Institute for Environment and Human Security, 2008), 17-18.

⁹⁸ Bates, "Environmental Refugees?," 468.

refugees due to the lack of choice faced by those seeking refuge from environmental changes. "Given this logic, environmental refugees should be those who flee from life-threatening environmental change as urgently and desperately as political refugees flee from violence"⁹⁹. Perhaps the most cogent conceptualisation of the differences between the various categories of persons affected by the environment is to be found in a study by the UN University Institute for Environment and Human Security (UNU-EHS) which echoes Bates' findings above, indicating three categories of environmental displacement: Environmental Refugee; Environmental Migrant and; Environmentally Motivated Migrant.¹⁰⁰

Most of the literature distinguishes between slow-onset disasters – such as drought, desertification, deforestation and sea-level rise – and sudden-onset disasters – such as floods and storms.¹⁰¹ Unfortunately, much of this literature misses the importance of environmental changes as a result of human causes. To counter this, Westing proposed three categories: migrants who move due to an acute event; migrants who move due to gradually worsening situation; and those migrations in which there is a clash of pre-modern and modern cultures.¹⁰² The third category is somewhat definitionally confusing, but relates to what Homer-Dixon refers to as 'resource capture', recognising that much environmentally induced displacement occurs as a result of modernity and industrialisation. Westing describes it as, "(t)he pre-emption for modern uses (mechanized agriculture, urbanization, industrialization etc.) of large semi-natural areas inhabited by pre-modern indigenous peoples who are dependent upon their traditional means of support (subsistence farming, pastoralism, shifting slash-and-burn agriculture, hunting, and gathering of wild fruits etc.)...(causing) the indigenous people to become displaced".¹⁰³ Dams could easily be added to the list of causes of migration in these cases as many in this third category are clearly unable

⁹⁹ Shin-wha Lee, "In Limbo: Environmental Refugees in the Third World," in *Conflict and the Environment*, ed. Nils Petter Gleditsch (Dordrecht: NATO, 1997).

¹⁰⁰ Fabrice Renaud et al., "Control, Adapt or Flee: How to Face Environmental Migration?," *Interdisciplinary Security Connections: UNU- EHS* 5(2007). 31.

¹⁰¹ Vikram Kolmannskog, "Climate Changed: People Displaced," ed. Richard Skretteberg (Oslo: Norwegian Refugee Council, 2009), 6. Oli Brown describes these as *Climate Processes* and *Climate Events*. See: Oli Brown, "Climate Change and Forced Migration: Observations, projections and implications," in *Human Development Report Office: Occasional Paper*, ed. UNDP (Geneva: United Nations Development Programme, 2007), 8.

¹⁰² Arthur H. Westing, "Environmental Refugees: A Growing Category of Displaced Persons," *Environmental Conservation* 19, no. 3 (Autumn 1992): 205.

¹⁰³ Westing, "Environmental Refugees," 206.

to return due to the permanency of the changes.¹⁰⁴ Inclusion of this third category is important because it captures an often overlooked political dimension to environmental change and population movements.

Understanding the causes of migration as a result of environmental change as well as the technicalities of who is a refugee or forced migrant is important in the context of this thesis only inasmuch as these issues relate to security. Although there is a wider debate as to whether migration should be considered a security issue at all¹⁰⁵, the security aspect of migration as it relates to the environmental security discourse revolves around the likelihood of conflict brought about by environmentally induced migration. Myers initially raised the idea of environmental refugees from a security perspective in 1986,¹⁰⁶ increasing the profile of the topic even more in 1993 after declaring that global warming was likely to induce up to 150 million environmental refugees worldwide. Myers' writing has consistently had a securitising effect on migration, in this case suggesting that "(i)t requires a leap of the imagination to envisage 150 million destitutes abandoning their homelands, many of them crossing international borders. They would be all the more disruptive in a world struggling to cope with a plethora of environmental problems"¹⁰⁷. By 2002 he estimated that there were already 25 million environmental refugees.¹⁰⁸ A more recent report has suggested that the number could increase to a neat billion by the middle of the 21st century.¹⁰⁹ It is unsurprising then, that with numbers like these, and suggestions such as those put forward by the ECAC project linking large scale migrations with violent conflict, that security scholars have increasingly concerned themselves with the idea of environmental refugees.

As has already been observed, this is generally not thought of as conflict between nations in the realist sense, but conflict at the intrastate level. The main research

¹⁰⁴ An estimated 10 million hydropower construction forced migrants occurred per year throughout the 1990s: Li Heming, Paul Waley, and Phil Rees, "Reservoir Resettlement in China: Past Experience and the Three Gorges Dam," *The Geographical Journal* 167, no. 3 (September 2001): 196-97.

¹⁰⁵ Roland Dannreuther, *International Security: The Contemporary Agenda* (Cambridge: Polity Press, 2007), 101.

¹⁰⁶ Myers, "The Environmental Dimension to Security Issues."

¹⁰⁷ Norman Myers, "Environmental Refugees in a Globally Warmed World," *BioScience* 43, no. 11 (December 1993): 759.

¹⁰⁸ Norman Myers, "Environmental Refugees: A Growing Phenomenon of the 21st Century," *Philosophical Transactions: Biological Sciences* 357, no. 1420 (2002): 610.

¹⁰⁹ "Human Tide: The Real Migration Crisis," *Christian Aid*, May 2007: <http://www.christianaid.org.uk/Images/human-tide.pdf>.

relevant to migration, the environment, and security presented as part of Homer-Dixon's ECAC project is Ashok Swain's work on the tension between India and Bangladesh that has arisen due to large migrations from Bangladesh to India already described above. In a separate article Swain discusses group versus group conflict more generally:

Wherever environmental migrants settle, they flood the labour market and add to the local demand for food and other basic necessities, which puts new burdens on society...The influx of migrants is likely to deplete local food supplies and to drive up food prices...(and t)he increasing competition for common property resources – water, grazing areas, forests – is likely to be especially damaging to the local hosts.¹¹⁰

As to whether the results of Swain's studies in South Asia are applicable across cultures and geographies is an interesting question.

Reuveny's more recent paper focuses on two case studies: 'the dustbowl' of the Great Plains in the USA in the 1930's and Bangladesh since the Farakka Barrage. His conclusions broadly align with those of Swain above and can be broken into four categories. Firstly, the arrival of migrants can burden the receiving area's economy and resource base, creating native-migrant competition. Second, environmental migrants and receiving area residents may belong to different ethnic groups, further heightening tensions. Third, the receiving government may fear that migrants wish to destabilise its rule. Fourth, migrants may be encouraged by vested interests to challenge or blame the state for their poverty, inflaming existing seeds of conflict.¹¹¹ Reuveny explains that environmental migration can lead to conflict but does not necessarily promote it. He suggests that from a policy perspective, "adaptation-in-place" can have a positive effect.¹¹² Reuveny's analysis introduces an important aspect of migration and conflict, that is, the potential for state based conflict as a secondary effect of localised tensions and conflict.

¹¹⁰ Ashok Swain, "Environmental Migration and Conflict Dynamics: Focus on Developing Regions," *Third World Quarterly* 17, no. 5 (1996). 969.

¹¹¹ Rafael Reuveny, "Environmental Change, Migration and Conflict: Theoretical Analysis and Empirical Explorations," in *Human Security and Climate Change* (Oslo June 2005). 4-5. In a separate article, Reuveny summarises these elements as: Competition; Ethnic Tension; Distrust and; Faultlines. See: Rafael Reuveny, "Climate Change-Induced Migration and Violent Conflict," *Political Geography* 26(2007).

¹¹² Reuveny, "Environmental Change, Migration and Conflict: Theoretical Analysis and Empirical Explorations." 22.

Surhke is more sceptical about the likelihood of conflict as a result of environmental changes and catastrophes. She links the *causes* of environmental migration more specifically to the *likelihood* of conflict, observing that sudden-onset migrations such as from flooding, famine and earthquakes are usually within the remit of aid and international disaster relief agencies and, therefore, conflict is more easily mitigated.¹¹³ Slow-onset disasters, because the effects are spread over time, allow “both migrants and receiving areas some room to manage”¹¹⁴. This contrasts somewhat to both Homer-Dixon’s, Swain’s and Reuveny’s assertions that slow-onset disasters such as the Farakka Barrage can lead to conflict, as well as Kahl’s point that when elites inflame and direct tensions that result from, or are related to these slow-onset environmental issues, violence is possible. In either case, obviously the specifics of the situation are important.

Barnett agrees that large migrations are likely as a result of climate change and, given that large migrations in the past have indeed brought about conflict, there is certainly a possibility that conflict may result from climate change induced migrations.¹¹⁵ His main concern, however, is that by securitising the issue of migration and possible conflict, the focus is shifted from foreign policy and aid to a military perspective.¹¹⁶ Rather than focusing on the security, and therefore protection of those affected by environmental changes, securitising language tends to frame victims as threats, encouraging a defensive, national security agenda. Barnett’s human security approach to environmental security and migration views migration as more of an “exercise of agency” where individuals adapt to a changing environment.¹¹⁷ This contrasts with the language of disempowerment often used in environmental migration discourse which tends to view migrants as hapless victims.

The links between environmental changes, migration and security are often tenuous and incomplete, and the classification of those impacted by environmental changes and the numbers likely to be affected are highly contested. Although there is no consistent causal connection between environmental changes, migration and

¹¹³ Astri Suhrke, "Environmental Degradation, Migration, and the Potential for Violent Conflict," in *Conflict and the Environment*, ed. Nils Petter Gleditsch (Dordrecht: Kluwer Academic Publications, 1997), 263.

¹¹⁴ Suhrke, "Environmental Degradation, Migration, and the Potential for Violent Conflict," 263.

¹¹⁵ Jon Barnett, "Security and Climate Change," in *Working Paper 7* (Norwich: Tyndall Centre for Climate Change Research, October 2001). 8.

¹¹⁶ Barnett, "Security and Climate Change". 11.

¹¹⁷ O'Brien and Barnett, "Global Environmental Change and Human Security," 383.

security issues, there are nevertheless frequently observed links between the environment, migration, and conflict. The large amount of literature on the subject is, once again, a good indication of the desire of academics and policymakers to understand the ways that environmental processes impact at various levels of analysis. In this case, the interest is in how environmental processes impact on individuals and communities, and how this in turn can have negative consequences for both state and human security outcomes. Attempting to understand these links highlights the importance of a systemic understanding of environmental security. Although there are many intervening variables that operate between environmental changes, migration and security, the evidence suggests that there are connections that must be taken seriously and investigated in any study linking the environment and security.

Positivism and Quantitative Studies

A smaller but important part of the environmental scarcities and violent conflict literature is the positivist approach led by Nils Petter Gleditsch of the Peace Research Institute Oslo (PRIO). Gleditsch, a quantitative researcher, is particularly critical of Homer Dixon. He believes the environmental security literature can be ontologically divided between neo-Malthusians on one hand and the Cornucopians on the other.¹¹⁸ Neo-Malthusians such as Homer-Dixon and Diamond focus on resource scarcity, population growth and conflict whereas Cornucopians are more optimistic, believing that ingenuity, technology and market mechanisms can solve current and future resource challenges.¹¹⁹ He provides a thorough positivist alternative to the main body of environmental security literature, instead focusing on causal mechanisms and hypothesis testing.¹²⁰

Although Gleditsch somewhat misunderstands the value of case studies,¹²¹ his critique of the literature must be taken seriously by anyone involved in examining the links between the environment and security. He is particularly concerned about the

¹¹⁸ An early work that established this dichotomy is: Norman Myers and Julian L. Simon, *Scarcity or Abundance? A Debate on the Environment*. (New York: W.W. Norton and Company, 1994).

¹¹⁹ Nils Petter Gleditsch and Henrik Urdal, "Ecoviolence? Links between Population Growth, Environmental Scarcity and Violent Conflict in Thomas Homer – Dixon's Work," *Journal of International Affairs* 56, no. 1 (Fall 2002): 287-88.

¹²⁰ Nils Petter Gleditsch, "Armed Conflict and the Environment: A Critique of the Literature," *Journal of Peace Research* 35, no. 3 (May, 1998).

¹²¹ Gleditsch, "Armed Conflict and the Environment," 391.

lack of evidence in regards to the statements and conclusions that are made about environmental security, leaving the field of inquiry open to “speculation and conjecture”¹²². He is critical of Homer Dixon in that Homer-Dixon’s work on environmental scarcity does not pay enough attention to regime type – more specifically it lacks consideration of the impact that democracy has on conflict.¹²³ Furthermore, many of the indicators used by Homer-Dixon tend to double as economic indicators, for example “certain types of environmental degradation – like deforestation, lack of water and sanitation, and soil erosion – are part and parcel of underdevelopment”¹²⁴.

His greatest criticism is saved for the untestability and over complexity of the models developed by Homer-Dixon. This is an understandable concern for a quantitative theorist focused on large-*N* studies. He points out for example that the case of Chiapas discussed in *Ecoviolence* is explained by “seven (mostly economic) independent variables acting through nine intervening variables and one additional independent variable”¹²⁵. Or in the case of South Africa, the model relies on “four exogenous variables, acting through twenty-one intervening variables and forty-five causal mechanisms to account for the dependent variable, violence”¹²⁶. He also criticises the lack of specificity of the variables themselves, for example, the variable ‘health problems’ is overly vague. He then goes on to criticise the nature of the case studies undertaken by Homer-Dixon and the ECAC project; specifically that they were chosen on the dependent variable – violent conflict. Gleditsch points out that choosing cases on the dependent variable comes with severe limitations to testability, replicability and the ability to draw conclusions about positive causal links. In a separate article, Gleditsch and his associates quantitatively examine the role of a nation’s ecological footprint in incidences of civil conflict, finding “little if any evidence for a connection between the neomalthusian factors captured by these indicators of sustainability and the onset of civil conflict”¹²⁷.

¹²² Gleditsch, "Armed Conflict and the Environment," 387.

¹²³ Gleditsch and Urdal, "Ecoviolence?," 292.

¹²⁴ Gleditsch, "Armed Conflict and the Environment," 390.

¹²⁵ Gleditsch, "Armed Conflict and the Environment," 390.

¹²⁶ Gleditsch and Urdal, "Ecoviolence?," 290.

¹²⁷ Helga Malmin Binningsbo, Indra de Soysa, and Nils Petter Gleditsch, "Green Giant or Straw Man? Environmental Pressure and Civil Conflict, 1961-99," *Population and Environment* 28(2007).

Gleditsch is also critical of the literature that claims that environmental scarcity leads to violent conflict, pointing out that it is often war that leads to environmental degradation. Furthermore, he criticises the propensity of environmental security studies to use the “future as evidence”¹²⁸. The *potential* for violent conflict is often at the centre of environmental security discourse, rather than the *evidence* for conflict. In Gleditsch’s opinion, “(t)hese are hypotheses based on controversial theory and debatable extrapolations, rather than ‘data’ which may confirm predictions... ‘There will be water wars in the future’ is no more testable than the proverbial ‘The End of the World is at Hand!’”¹²⁹. He therefore suggests – no doubt with tongue firmly in cheek – that if researchers place bets on the likelihood of violent conflict caused by environmental degradation it may lead to greater scholarly precision.

Laying differences between qualitative and quantitative studies aside for a moment, some of Gleditsch’s work on water resources is more specifically relevant to this thesis. His earlier work on the subject examined the idea of “water wars” between nations that share a river basin. Gleditsch and his colleagues suggest that shared river dyads have a higher frequency of violent outbreaks than those that do not share a river.¹³⁰ It is unclear, however, whether the conflict is a result of the availability of water, or disputes over navigation, pollution, fishing, or territory.¹³¹ His follow-up article demonstrates a greater understanding of the various ways that nations share rivers, reflecting a more comprehensive and up-to-date river data-set.¹³² This investigation indicates that nations that share a river boundary are twice as likely to experience conflict as nations that do not.¹³³ Two issues are of particular significance: the first is that the more developed a shared river dyad is, the less likely it is to experience conflict. The second is that the greater the water resources in the shared basin, the greater the likelihood of conflict. Both of the issues are relevant to the Mekong in that the basin is shared by developing nations and it has an abundance of water resources. The idea that an abundance of water rather than scarce water resources is more likely to lead to conflict is antithetical to the position

¹²⁸ Gleditsch, "Armed Conflict and the Environment," 393.

¹²⁹ Gleditsch, "Armed Conflict and the Environment," 394.

¹³⁰ Hans P. W. Tose, Nils Petter Gleditsch, and Havard Hegre, "Shared Rivers and Interstate Conflict," *Political Geography* 19(2000): 990.

¹³¹ Tose, Gleditsch, and Hegre, "Shared Rivers and Interstate Conflict," 992.

¹³² Nils Petter Gleditsch et al., "Conflicts Over Shared Rivers: Resource Scarcity or Fuzzy Boundaries?," *Political Geography* 25(2006): 366-67.

¹³³ Gleditsch et al., "Conflicts over Shared Rivers," 373.

of Homer-Dixon. This scenario, often referred to as the “resource curse” requires further investigation in relation to shared rivers, according to Gleditsch and will be examined in more detail in the next section.¹³⁴

It is evident that there is a small, but nevertheless important, component of the environmental security literature that focuses on quantitative and positivistic research. Much of the work done in this area serves to critique previous literature on environmental scarcity and conflict – especially that of Homer-Dixon. Although the literature often leads to generalised conclusions that give a broad view rather than insights into specific cases, the findings contribute to the overall depth of knowledge of environmental security.

Section Three: Towards Human Oriented Environmental Security Political Ecology and Violent Environments

A major critique of the second wave of environmental security is from the school of political ecology. In *Violent Environments*, Peluso and Watts provide a harsh critique of the environmental scarcities and violent conflict literature. For the most part, it singles out the work of Homer-Dixon, deconstructing, critiquing, and criticising his theoretical framework, his methodological approach, and, on occasions, his motives.¹³⁵ Whereas Gleditsch’s positivist critique focused on the over-complexity of Homer-Dixon’s framework, Peluso and Watts claim the opposite, stating that “the entire analysis is based on a simple, causal model of social friction and violence with few theorised intervening processes”¹³⁶. According to Peluso and Watts:

For Homer-Dixon, environmental change is driven by ‘precursor ideational factors’, an inchoate notion embracing a shopping list of ‘institutions, laws, rights, and norms.’ No effort is made to theorize or place institutions within specific political economic forms (e.g., authoritarian capitalism, social democratic welfare capitalism, postsocialism), thereby to suggest, for example, conditions under which these

¹³⁴ Gleditsch et al., "Conflicts over Shared Rivers," 380.

¹³⁵ For example see: Betsy Hartmann, "Will the Circle Be Unbroken? A Critique of the Project on Environment, Population, and Security," in *Violent Environments*, ed. Nancy Lee Peluso and Michael Watts (Ithaca: Cornell University Press, 2001), 58. Hartmann claims that Homer-Dixon and Percival chose not to link violent conflict to the environment in Rwanda so as to avoid the "racial stereotyping of Africans." For Homer-Dixon's response to these accusations see: "Environmental Change and Security Project Report No. 9," ed. Geoffrey D. Dalbelko (Washington D.C.: Woodrow Wilson International Centre for Scholars, 2003), 89-93. Peluso and Watts also claim that ‘Malthusian’ environmental security analyses “are informed by a deep fear of the poor and their claims to resources, despite radical changes in the world since Malthus’s time.” See pages 8-9.

¹³⁶ Nancy Lee Peluso and Michael Watts, eds., *Violent Environments* (Ithaca: Cornell University Press, 2001), 13.

institutions might differ in form or effect...(Homer-Dixon's model operates from) an incoherent (and partial) account of environmental transformation that does not stand on a theory of social transformation or political economy...So much of this work fails dramatically in virtue of its ad hoc character, its tendency to overgeneralise, and a sort of "blender" approach to causality as variable upon variable is thrown into a theoretical stew pot.¹³⁷

Peluso and Watts identify what they describe as three fatal weaknesses to Homer-Dixon's approach. Firstly, empirical weakness: "it must be demonstrated that there are clear and unequivocal connections between 'environmental scarcity' and dislocation or hardship, intergroup segmentation, and the weakening of the state. These connections must be *shown*, not simply asserted"¹³⁸. Secondly, under-specificity: "the contours of the broad political economy (under which complex class and social forces operate) and how the rhythms of environmental change and accumulation shape the processes of exclusion, disenfranchisement, and displacement must be specified"¹³⁹. Finally, Homer-Dixon's use of ingenuity: "the ingenuity hypothesis is exceedingly weak and porous...The supply of ingenuity is an astonishingly banal and inaccurate concept to explain why certain political outcomes occur – as if all political struggles simply require a nifty invention that the less developed and "transitional" world is too maladaptive or pedestrian to accomplish"¹⁴⁰.

In summary, Peluso and Watts believe that Homer-Dixon's model is empirically weak, under-theorised, overly general – and therefore lacking in specificity as well as lacking an overarching theory related to political economy and power structures. This way of thinking is perpetuated and reinforced in subsequent political ecology texts without further research or consideration of the work of Homer-Dixon.¹⁴¹ Instead of this "ad hoc" approach they forward political ecology as an alternative. A blend of Marxian political economy and a Foucauldian approach to ecology,¹⁴² political

¹³⁷ Peluso and Watts, eds., *Violent Environments*, 18-20.

¹³⁸ Peluso and Watts, eds., *Violent Environments*, 20.

¹³⁹ Peluso and Watts, eds., *Violent Environments*, 20.

¹⁴⁰ Peluso and Watts, eds., *Violent Environments*, 20-22.

¹⁴¹ R. P. Neumann, *Making Political Ecology*, ed. Alexander B. Murphy, *Human Geography in the Making* (London: Hodder Education, 2005), 159-61.

¹⁴² Peluso and Watts, eds., *Violent Environments*, 24. According to Neumann, there is no single methodology or set of theoretical concepts that can be used to define political ecology. See: R. P. Neumann, "Political Ecology," in *International Encyclopaedia of Human Geography*, ed. Rob Kitchin and Nigel Thrift (London: Elsevier Ltd., 2009), 229.

ecology views violence as “a site-specific phenomenon rooted in local histories and social relations yet connected to larger processes of material transformation and power relations”¹⁴³. Both temporal and spatial/scale specificity are important to political ecologists¹⁴⁴. “The specification of actors – peasants, indigenous peoples, workers, the state, transnational capital – in a particular historical moment of violence is made with respect to their positions within precise systems of accumulation and fields of power”¹⁴⁵.

The unusual blend of Marxist power structures and post-structural discourse analysis means that political ecology has a foot in both camps of the international and the local. Specificity is derived from analysing the minutiae of the local – individuals, communities and specific political and historical contexts. On the other hand a broad context of anti-globalisation and postcolonial discourse is often the overarching theme of the case studies provided in *Violent Environments*.¹⁴⁶ This approach undoubtedly brings an element of specificity, and an overarching political economic theory, however it does leave political ecology open to the same questions of bias and over-generalisation that they themselves level against Homer-Dixon. For example, Hartmann accuses Homer-Dixon of blaming local inhabitants for the violent conflict occurring as a result of localised environmental degradation instead of placing the blame where, according to her, it belongs – at the feet of multinational corporations and the global North: “Effective demand elsewhere also may drive environmental degradation much more than local poverty and population growth”¹⁴⁷. This is not to suggest that there is no merit in the assertion, but instead, that the “clear and unequivocal connections” that they desire from researchers outside political ecology appear to be absent at times within their own field.

Although political ecology interacts somewhat with the environmental security literature – specifically the environmental scarcities and violent conflict literature –

¹⁴³ Peluso and Watts, eds., *Violent Environments*, 5.

¹⁴⁴ Neumann, "Political Ecology," 230.

¹⁴⁵ Peluso and Watts, eds., *Violent Environments*, 6.

¹⁴⁶ For example see: S. Ravi Rajan, "Toward a Metaphysics of Environmental Violence: The Case of the Bhopal Gas Disaster," in *Violent Environments*, ed. Nancy Lee Peluso and Michael Watts (Ithaca: Cornell University Press, 2001).and; Nancy Lee Peluso and Emily Harwell, "Territory, Custom, and the Cultural Politics of Ethnic War in West Kalimantan, Indonesia," in *Violent Environments*, ed. Nancy Lee Peluso and Michael Watts (Ithaca: Cornell University Press, 2001).

¹⁴⁷ Hartmann, "Will the Circle Be Unbroken?," 50-51.

the question must be asked whether political ecology actually fits within the realm of security studies. On reflection, it is highly questionable whether inclusion was the intention of the authors of *Violent Environments*. There is no attempt to securitise issues within the book by driving them up the policy agenda, nor is an alternative security framework or coherent securitising theory put forward in place of what they have deconstructed. According to Peluso and Watts, the main aim of *Violent Environments* is: “that a better understanding of the specific ways in which history, memory, and the practices of people, states, and the forces of capitalism often come together violently might provide for an optimism of both the intellect and the will”¹⁴⁸. Absent is any specific reference to the environment. Given the “devastating critique” that they claim to have served up to Homer-Dixon, one would have expected them to have also engaged with the national security literature that led to the development of Homer-Dixon’s theoretical framework.

As it stands, political ecology is in fact anti-security. It is difficult to place political ecology into any realm of old or new security – even environmental and human security – although it certainly brings a greater specificity to the local, human level of analysis. This does not mean that it should be dismissed out of hand. Given Homer-Dixon’s large presence – and that of the notion of environmental scarcities and violent conflict – in the environmental security discourse, such a clear critique should be taken seriously. Political ecology is relevant then in that critiques the under-specificity often found in environmental security literature and because it highlights the need for a greater focus on the power structures that lead to violent conflict and environmental destruction.

Dalby and Critical Ecology

Simon Dalby’s *Environmental Security* is a considerable step away from the environmental scarcities and violent conflict thesis. His analysis is critical in that it is similar to that of the Copenhagen school, questioning the state as the referent object of security, as well as critical in the Foucauldian sense, questioning ideas that appear ‘self-evident’.¹⁴⁹ As with Homer-Dixon, Dalby’s contribution to the environmental security discourse is complex, challenging commonly held

¹⁴⁸ Peluso and Watts, eds., *Violent Environments*, 38.

¹⁴⁹ Dalby, *Environmental Security*, xxi-xxii, xxx-xxxii.

perceptions of what is meant and understood by 'environment' as well as the commonly held notion that environmental change is always a negative and unusual occurrence.

In many respects, Dalby concerns himself with the North/South divide, and for this reason is highly critical of Kaplan's "oversimplified geopolitical specification of Malthusian-induced social collapse" and its influence on political and security thinking.¹⁵⁰ According to Dalby, this geopolitical oversimplification is evident in Kaplan's division of the world into the rich North and the poor South and his adoption of Huntington's *The Clash of Civilisations* thesis. This leads Kaplan to the conclusion that environmental degradation, overpopulation, and a tendency in the South towards violence and crime will lead to increasing political instability and social disruption that threatens the richer but less populous North. "Nature unchecked" is therefore something to be feared.¹⁵¹ Similar to political ecology's critique of Kaplan, Dalby refers to this "geopolitical shorthand" as the "antithesis to detailed geographical understanding"¹⁵².

Unlike political ecology, Dalby does not conflate Kaplan with Homer-Dixon. He takes both Homer-Dixon's ECAC and Baechler's ENCOP projects seriously, summarising their findings authentically without the bias demonstrated by Peluso and Watts. Dalby, however, highlights and expands on what is an important alternate framework to the scarcities and violent conflict model: the resource curse. These differing perspectives have been described as either a "shrinking pie" or "honey pot"¹⁵³ – "shrinking pie" referring to the neo-Malthusian concept of resource scarcities and "honey pot" referring to an abundance of natural resources. Dalby refers to de Soysa's argument that countries with a high proportion of natural resource extraction have a greater tendency towards civil war. The argument generally applies to non-renewable resources such as oil, diamonds and copper, but has also been applied to

¹⁵⁰ Dalby, *Environmental Security*, 38. Chapter 2 (pages 21-40) provides a detailed critique.

¹⁵¹ Dalby, *Environmental Security*, 39.

¹⁵² Dalby, *Environmental Security*, 40.

¹⁵³ Dalby, *Environmental Security*, 91; Indra de Soysa, "Ecoviolence: Shrinking Pie, or Honey Pot?," *Global Environmental Politics* 2, no. 4 (November 2002); Jean-Benoit Fournier, "'In the Wilderness with a Honey Pot and a Shrinking Pie:' An Overview of the Ecoviolence Debate," *Undercurrent Journal* V, no. 1 (Summer 2008).

renewable resources – especially timber.¹⁵⁴ Elites who are able to capture and monopolise these resources have little, if any, incentive to develop manufacturing or agriculture within the state, seeking instead to protect – violently if necessary – sources of natural wealth generation. It is therefore argued that “greed rather than grievance is more usually the cause of conflict concerning resources”¹⁵⁵.

This is a divergent view from Homer-Dixon’s findings that resource capture results from elites monopolising *scarce* resources. According to the “honey pot” thesis, elites capture the resource for exactly the opposite reason, and political instability and violent conflict results from competing factions vying for control of the *abundant* resource in order to benefit financially from the wealth it creates.¹⁵⁶ As a result, innovation and competition also suffer, turning Homer-Dixon’s ingenuity thesis on its head. According to de Soysa then, ingenuity is more likely to be stifled by abundance than by scarcity.¹⁵⁷ As is usual for theoretical debates of this kind, there are strong arguments for both sides.¹⁵⁸

Dalby is also critical of the ECAC project in that it assumes that environmental change is a negative occurrence. From Dalby’s perspective, which is reflective of themes within political ecology, changing environments are normal processes of life. To try to “secure” the environment against change is nonsensical from this perspective.¹⁵⁹ The assumption that environmental change is a negative occurrence that must be avoided also contradicts discourses of development that are premised on changes in the environment brought about by developments in agriculture, infrastructure and industry. These environmental changes are often what enable economies to shift their status from least developed, to developing, to developed. Therefore according to Dalby, if environmental changes are indeed negative, and threats to environmental security, then it is “the dominant structures of the global

¹⁵⁴ Indra De Soysa and Eric Neumayer, "Resource Wealth and the Risk of Civil War Onset: Results from a New Dataset of Natural Resource Rents, 1970 – 1999," *Conflict Management and Peace Science* 24(2007): 205; de Soysa, "Ecoviolence: Shrinking Pie, or Honey Pot?," 7.

¹⁵⁵ Dalby, *Environmental Security*, 92.

¹⁵⁶ The blood diamonds of Sierra Leone are frequently given as examples. See: Dalby, "Ecological Politics, Violence, and the Theme of Empire," 5-6.

¹⁵⁷ Soysa, "Ecoviolence: Shrinking Pie, or Honey Pot?," 23-27; Dalby, *Environmental Security*, 92.

¹⁵⁸ See for example: Christa N. Brunnschweiler and Erwin H. Bulte, "Natural Resources and Violent Conflict: Resource Abundance, Dependence, and the Onset of Civil Wars," *Oxford Economic Papers*, no. 61 (2009); Vally Koubi et al., "Do Natural Resources Matter for Interstate and Intrastate Armed Conflict?," *Journal of Peace Research* 50, no. 6 (2013).

¹⁵⁹ Dalby, "Environmental Security: Ecology or International Relations?," 7.

economy, in its (violent) processes of expansion and disruption” that are the greatest drivers of change.¹⁶⁰

Dalby expands on this notion through the theme of “Empire”. Empire relates to patterns of consumption in the global economy that shift resources from the periphery to the core. “Ecosystem people”, who usually live subsistence lifestyles at the periphery, are much more vulnerable – due to their reliance on local renewable resources and their relative poverty – than those at the core, or the “biosphere people”, who – due to their relative wealth – are able to draw food and other important resources from various parts of the globe through the complex system of trade that upholds the global economy.¹⁶¹ Violence and political disruption at the periphery, therefore, is frequently related to these consumption patterns at the core.¹⁶² Resistance to disruptions from activities that privilege the core over the periphery (in that goods are transferred from the periphery to the core), such as ‘land grabs’, deforestation, industrial development, and pollution, as well as competition over control of and profits from tradable resources, are even better explanations for violent conflict and civil war than the dichotomous “shrinking pie” or “honey pot” theses, according to Dalby.¹⁶³ This highlights the idea that the expansion of empires and modern industrial society is usually a violent process.¹⁶⁴

Dalby asserts that as a result of the modern globalised economic Empire, human beings are currently living in the age of the Anthropocene:

What is most worrisome to anyone who observes these matters is not any single concern – be it climate change, biodiversity loss, synthetic chemicals, deforestation, long-lived radio isotopes, or any one of many other matters – but the totality of the disruptions caused by modern industrial systems and the consumption of their products, whose cumulative and increasing impact has reached into all parts of the biosphere.¹⁶⁵

¹⁶⁰ Dalby, *Environmental Security*, 79.

¹⁶¹ Dalby, *Environmental Security*, 134.

¹⁶² Dalby, "Ecological Politics, Violence, and the Theme of Empire," 5-7.

¹⁶³ Dalby, *Environmental Security*, 75-80; Dalby, "Ecological Politics, Violence, and the Theme of Empire," 5-7.

¹⁶⁴ Dalby, *Environmental Security*, 76.

¹⁶⁵ Dalby, *Environmental Security*, xxxi. See also: Peter M. Vitousek et al., "Human Domination of Earth's Ecosystems," *Science* 277, no. 5325 (1997).

In large part, these changes are driven by “carboniferous capitalism”¹⁶⁶ which is responsible for significant changes in the composition of the atmosphere and other harmful polluting externalities.¹⁶⁷ There is another contradiction in operation here. Economic liberalism, which is often seen as the panacea for poverty and environmental insecurity in the developing world, relies on patterns of consumption and economic growth that undermine the stability of the greater biosphere. As Dalby puts it, “civilisation does things to nature in the process of doing things to itself”¹⁶⁸.

The themes of Empire and the Anthropocene not only raise questions about the traditionally conceived links between the environment and conflict, it also raises questions about the meaning of ‘environment’ itself. ‘Environment’ is a colonial construction, according to Dalby, “one that operates on the urban assumptions of an external nature whose resources are to be managed, rather than a context, place, or home that is to be lived in”¹⁶⁹. The environment as commonly perceived in the modern era is therefore:

...a catchall residual category which usually refers to the non-human material context of human activities. Premised on the extraordinary modern assumption that divisions between humanity and the rest of the biosphere are a useful ontological starting point the term environment has come to encompass the definition of the part of ‘nature’ that provides the backdrop for human affairs.¹⁷⁰

Due to the scale of anthropogenic disruptions in the biosphere and their complex and far-reaching interactions, thinking about the environment as the backdrop to human activities and history is no longer appropriate.¹⁷¹ Conceiving of the environment as ‘other’ or separate from humanity has allowed civilisation to be built on the untenable assumption that consumption of natural resources and pollution of the environment affects ‘the environment’ but not humanity as such – at least, not the urban core. As long as nature’s abundance remained plentiful, this fiction could continue; however,

¹⁶⁶ Dalby, *Environmental Security*, 73. See note 27 (page 208) for a discussion of Lewis Mumford's role in the conception of this term.

¹⁶⁷ Dalby, "Ecology, Security, and Change in the Anthropocene," 158-59.

¹⁶⁸ Dalby, *Environmental Security*, 133.

¹⁶⁹ Dalby, *Environmental Security*, 99. Dalby highlights the genesis of environment from ‘environ’, usually associated with that which surrounds (usually a town). See also page 126.

¹⁷⁰ Dalby, "Environmental Security: Ecology or International Relations?," 5.

¹⁷¹ Dalby, "Environmental Security: Ecology or International Relations?," 7.

the scale of modern anthropogenic disruptions now necessitates a change in thinking.

Dalby therefore suggests thinking in terms of ecology rather than the environment.¹⁷² Ecology includes, rather than excludes; it connects rather than partitions. Ecology recognises that nature and ecosystems are connected in complex and interactive ways whereas the traditional way of thinking about the environment is to break it up into its separate components: rivers, mountains, fields, oceans etc., that are often linked with territorial boundaries. Ecology enables the possibility of thinking about the biosphere as a whole – and humans as integrally connected and dependant yet autonomous in that they are able to manipulate it to the extent witnessed in the Anthropocene.¹⁷³

The crucial point from a security perspective is that thinking about nature and the biosphere in these interconnected terms challenges the most basic assumptions of international relations: that states are the main object and preserver of security.¹⁷⁴ Furthermore, as Dalby observes, “the most important ecological processes are rarely contained neatly within the administrative boundaries of states”¹⁷⁵ meaning that there is a fundamental mismatch between state-based practices of sovereignty and the ecological crisis.¹⁷⁶ In fact, it is frequently the activities of states – especially in the global North – that allow and encourage environmental destruction through economic and military activities that have driven the growing global insecurity of the Anthropocene. Poorer states in the global South often lack the capabilities and development levels to be able to implement the needed changes.¹⁷⁷

This is indeed a serious challenge to the idea of environmental security specifically and security more generally. As Dalby points out, “(s)ecurity is a derivative concept, one that assumes that there is something else, outside of itself, that has to be secured”¹⁷⁸. Invoking the term ‘security’ not only raises issues in terms of policy priority, it also captures and provokes ideas of the protection and vulnerability of

¹⁷² Dalby, "Ecology, Security, and Change in the Anthropocene," 159-60.

¹⁷³ Dalby, *Environmental Security*, 132-33.

¹⁷⁴ Dalby, *Environmental Security*, 79.

¹⁷⁵ Dalby, "Ecology, Security, and Change in the Anthropocene," 161.

¹⁷⁶ Dalby, *Environmental Security*, 80.

¹⁷⁷ Dalby, "Environmental Security: Ecology or International Relations?," 9.

¹⁷⁸ Dalby, *Environmental Security*, xxi.

certain collectives from dangers or perceived future threats emanating from outside the collective. However, from a critical ecology perspective, international politics is something that happens within the biosphere, rather than environmental issues being an internal variable within the international order that can be addressed according to familiar patterns of behaviour and thinking.¹⁷⁹ The question relevant to environmental security is therefore: “what exactly is being secured?”¹⁸⁰ Is it the state, the international order or the natural environment?¹⁸¹

Dalby himself does not offer a comprehensive answer to the question or the challenges of state-based thinking about sovereignty and its juxtaposition with ecological challenges.¹⁸² Instead he suggests a range of options such as: a greater reliance on the governance of municipalities and corporations;¹⁸³ the localised skills and knowledge of those who live in rural areas;¹⁸⁴ a shift in cultural values from conspicuous consumption to conspicuous aestheticism;¹⁸⁵ and a general suggestion of a global security policy that focuses on reducing ecological disruption, enhancing the disaster assistance of states and militaries, and establishing patterns of aid and trade in response to ecological disruptions instead of confrontation and conflict.¹⁸⁶ More recently he has forwarded the idea of ‘sustainable security’ as formulated by the Oxford Research Group. Sustainable security focuses on “human security as primarily a matter of prevention, rather than violent action in the face of emergencies (which necessitates) thinking through the connections between ecological, economic and social changes”¹⁸⁷. As Dalby suggests, “A security strategy that fails to deal with the processes already in motion that are making people insecure is one doomed to failure”¹⁸⁸.

Dalby’s contribution is immensely valuable, given that his analysis progresses the environmental security discourse by shining a critical light on both the meaning and

¹⁷⁹ Dalby, "Environmental Security: Ecology or International Relations?," 3-4.

¹⁸⁰ Dalby, "Environmental Security: Ecology or International Relations?," 11.

¹⁸¹ Dalby, "Environmental Security: Ecology or International Relations?," 4.

¹⁸² Nor is it his intention to as he explicitly states in the introduction to *Environmental Security*. See: Dalby, *Environmental Security*, xxvii.

¹⁸³ Dalby, "Environmental Security: Ecology or International Relations?," 10.

¹⁸⁴ Dalby, *Environmental Security*, 80.

¹⁸⁵ Dalby, *Environmental Security*, 182.

¹⁸⁶ Dalby, *Environmental Security*, 162.

¹⁸⁷ Simon Dalby, "Environmental Dimensions of Human Security," in *Environmental Security: Approaches and Issues*, ed. Rita Floyd and Richard A. Matthew (New York: Routledge, 2013), 133.

¹⁸⁸ Dalby, "Environmental Dimensions of Human Security," 134.

usage of environment and security. His suggestion for a shift in thinking towards ecological disruption rather than environmental change is valuable in that it shifts the focus off the state as the referent object of security and the rigid demarcations associated with state-based thinking. The question of what, or who, the referent object of security is, still remains. What is clear, however, is that whether the concern is in relation to the biosphere, states, communities or individuals, the question continually comes down to: how does the natural environment interact with and threaten to negatively impact these various units of analysis? For Dalby the question is adjusted slightly: How do global economic and industrial processes threaten the natural environment, creating social and civilisational vulnerabilities? Mankind, it seems, rather than nature, is the driver of the negative changes that threaten civilisation.

Jon Barnett and Human Security

In *The Meaning of Environmental Security*, Barnett takes a normative approach, arguing that human security should be at the core of environmental security. In coming to this conclusion he first critiques the environmental security discourse and, in a similar vein to Dalby above, forwards the idea that using ecological principles provides a superior way of understanding environmental issues that interact with security. The idea of ecological security more easily leads to analyses that place humans at the centre of security discourse, rather than the usual state-centric prioritisation.¹⁸⁹

Before outlining his framework for understanding human security in an environmental context, Barnett also examines and critiques the earlier environmental security literature. As with the political ecology and critical ecology critiques above, he is highly critical of national and military security conceptualisations of environmental security that stem from the realist paradigm and place the nation-state as the referent object of security.¹⁹⁰ He observes that war and the preparation for war generally bring negative impacts to the environment. Military budgets also divert funds from other programs designed to improve social and ecological well-being.¹⁹¹ For these reasons, when considering the linkages between environmental change

¹⁸⁹ Barnett, *The Meaning of Environmental Security*, 127.

¹⁹⁰ Barnett, *The Meaning of Environmental Security*, 29.

¹⁹¹ Barnett, *The Meaning of Environmental Security*, 93-97.

and violence, Barnett asserts that “the causal connections between direct violence and environmental change are far stronger when considering direct [military] violence as a cause of vulnerability to environmental change, and far weaker when considering environmental change as a cause of direct violence”¹⁹². According to Barnett, the post-Cold War agenda of national security, as discussed in the first section above, brought environmental and social issues under its umbrella and had “the effect of broadening national security...without changing the nation-state as the referent object [therefore allowing] the further colonisation of domestic society by realism’s ultimately violent logic”¹⁹³. Accordingly, “(i)n this broader (but not deeper) agenda, security is still the preserve of states acting in their own interests”¹⁹⁴.

Barnett also criticises those who claim that resource scarcities are a direct cause of violent conflict. The idea of “resource wars” is imbued with a range of assumptions including the notion that humans, especially those in the global South, will resort to force and coercion rather than co-operate over scarce resources.¹⁹⁵ He questions the assumption that conflict and instability are always negative outcomes and that the status quo is therefore the optimal desire. Instability tends to be associated with negative outcomes when discussed in environmental degradation and violent conflict literature. However in cases of severe injustice, instability and a shift in the status quo is often what is required to bring justice and equity.¹⁹⁶ Barnett singles out Homer-Dixon’s work as “the most engaging and thoughtful” of the environmental degradation, population and conflict literature¹⁹⁷ and outlines what he believes is the most important finding within Homer-Dixon’s work: that “environmental problems are contributing to social disturbances, which may involve violence or, less sensationally but no less importantly, more structural forms of disadvantage”.¹⁹⁸ The conclusion that he draws from this is that Homer-Dixon’s research actually implies little connection between environmental scarcities and security – when security is viewed from a national security perspective.¹⁹⁹ Instead of continuing with research focused on violent conflict, therefore, a more productive research agenda – according to

¹⁹² Jon Barnett, "Environmental Security and Peace," *Journal of Human Security* 3, no. 1 (2007): 9-12.

¹⁹³ Barnett, *The Meaning of Environmental Security*, 48.

¹⁹⁴ Barnett, *The Meaning of Environmental Security*, 49.

¹⁹⁵ Barnett, *The Meaning of Environmental Security*, 53.

¹⁹⁶ Barnett, *The Meaning of Environmental Security*, 67-68.

¹⁹⁷ Barnett, *The Meaning of Environmental Security*, 61-62.

¹⁹⁸ Barnett, *The Meaning of Environmental Security*, 62.

¹⁹⁹ Barnett, *The Meaning of Environmental Security*, 64.

Barnett – would be to “examine cases where, in the face of similar pressures, violence was not the end product”.²⁰⁰

The question that remains, therefore, is why there such an interest in the linkages between environmental degradation and violence.²⁰¹ Barnett surmises that the environment and conflict literature obscures the role and responsibility of the North in the current global ecological crisis, focusing only on one of the possible impacts of environmental degradation without taking the root causes of this degradation seriously.²⁰² Most case-studies in the environmental scarcities literature are focused on the global South which, according to Barnett, can be read as “a case of ‘civilised’ Europeans constructing a barbaric Other”²⁰³. Although, there appears to be a lack of credible evidence that environmental scarcities are the cause of wars, “Politicians and military leaders ...[continue] to present war in Darwinian or Malthusian terms as a fight over subsistence needs, but this ‘state of nature’ rhetoric is a pragmatic device that denies responsibility for peaceful action, and justifies violence in lieu of meaningful dialogue”²⁰⁴.

The North-South divide in the environmental security literature raises a point similar to the idea of Empire as forwarded by Dalby. The environmental relationship between North and South is usually not one of violent conflict directed from the South to the North, but is instead a relationship of transference of harm, or environmental degradation from the North to the South through industrial processes.²⁰⁵ Wealth is contained in the developed North by the exploitation of cheap labour, materials and the environment of the South. Barnett therefore challenges the idea that environmental degradation is the most serious environmental security concern, instead asserting that the “most complex, uncertain, and potentially disruptive problems lie not in the realm of environmental sources but in silent, apolitical and pervasive processes which are overloading the planetary ‘sinks’”²⁰⁶. Given this, the continued focus of scarcity induced violent conflict in the

²⁰⁰ Barnett, *The Meaning of Environmental Security*, 64.

²⁰¹ Barnett, *The Meaning of Environmental Security*, 69.

²⁰² Barnett, *The Meaning of Environmental Security*, 70.

²⁰³ Barnett, *The Meaning of Environmental Security*, 57.

²⁰⁴ Barnett, *The Meaning of Environmental Security*, 56.

²⁰⁵ Barnett, *The Meaning of Environmental Security*, 53. See also: Edward A. Page and Michael Redclift, eds., *Human Security and the Environment: International Comparisons* (Cheltenham, UK: Edward Elgar, 2002), 1.

²⁰⁶ Barnett, *The Meaning of Environmental Security*, 52.

environmental security literature “obscures Northern complicity in the generation of the very environmental problems it scripts as threats...[thus leading to] the obsession with only one of the possible effects of environmental degradation (conflict) at the expense of other effects, and at the expense of taking seriously the root causes of the degradation”²⁰⁷.

Like Dalby and the proponents of political ecology, Barnett believes that a better understanding of what is, or should be, at the heart of environmental security can be gained by giving ecological processes a higher priority. “Ecological security” therefore emphasises the biosphere as that which is to be secured whereas traditionally, environmental security has been concerned with the security of the state.²⁰⁸ Shifting the perspective of security towards ecology means that ecological values can be taken more seriously at a policy level. The principal lessons that can be drawn from ecology are: that all life depends on a complex web of food chains; that these chains involve plants and animals, energy, water, carbon, and nutrients; that there are thresholds below which the viability of the species may rapidly and perhaps irreversibly decline; and that simple ecosystems tend to be more unstable than complex ones. [Additionally]...there are finite limits imposed by energy and material availability, and hence there are limits to the growth of human systems.²⁰⁹

The complexity and interconnected character of natural systems means that “(s)ecurity from an ecological theory perspective...involves thinking about the whole rather than the parts”²¹⁰. From an ecological perspective, therefore, complex ecosystems tend to be more stable than simple ones providing greater resilience in the face of disruption and change. In order to build resilience, social and ecological heterogeneity is the desired norm rather than social uniformity and ecological homogenisation.²¹¹ In this way Barnett directly links resilience with security, observing that traditional understandings of security that seek to protect the status quo and create groups of Others to be feared is the antithesis to the security brought about by diversity and difference.

²⁰⁷ Barnett, *The Meaning of Environmental Security*, 70.

²⁰⁸ Barnett, *The Meaning of Environmental Security*, 109.

²⁰⁹ Barnett, *The Meaning of Environmental Security*, 111.

²¹⁰ Barnett, *The Meaning of Environmental Security*, 111.

²¹¹ Barnett, *The Meaning of Environmental Security*, 112.

Although Barnett makes the case for ecological security, he is pragmatic about the term's deployment and its impact, or lack thereof. He observes that the literature about ecological security developed synonymously with the environmental security literature but that arguably, the ecological security literature has had very little impact on policy and discourse.²¹² According to Barnett, the concept of ecological security brings with it important understandings of the interactions between the environment and security, however, its alternative language means that it is less effective in impacting mainstream discourse. This makes ecological security the 'Trojan horse' of security that has been left outside the gates, "whereas environmental security has been wheeled inside"²¹³. Accordingly, one of the main functions of environmental security, according to Barnett, is to undermine and contest the meaning of security. Barnett therefore proposes to:

...maintain the label of 'environmental security', but to empty it of its existing meaning and refill it with notions of human security and positive peace...The principal difference is that putting people first and retaining the label maintains the ability to contest the substantive issue of what security is and for whom it applies.²¹⁴

Barnett therefore set himself the task of refilling environmental security with meaning by shifting the focus to human security. Shifting the focus to human security undermines traditional understandings of security. Barnett frames human security using the concepts developed by the United Nations Development Program (UNDP) explaining that according to UNDP, seven domains of human security have been identified: economic, food, health, environmental, personal, community, and political. At the heart of human security is the "provision of basic material needs such as nutritious food, clean air and water, and shelter"²¹⁵. In addition to these basic material needs, he also suggests that there are second set of requirements such as emotional, familial, and community support as well as opportunities that allow an

²¹² See for example: Dennis Pirages and Ken Cousins, eds., *From Resource Scarcity to Ecological Security: Exploring New Limits to Growth*, Global Environmental Accord: Strategies for Sustainability and Institutional Innovation (Cambridge, Massachusetts: MIT, 2005).

²¹³ Barnett, *The Meaning of Environmental Security*, 119.

²¹⁴ Barnett, *The Meaning of Environmental Security*, 121.

²¹⁵ Barnett, *The Meaning of Environmental Security*, 125.

individual “a personal sense of involvement, purpose, belonging, excitement, challenge, satisfaction, love, enjoyment and confidence”.²¹⁶

Human security therefore not only challenges traditional formulations of security but also the discourse that is generally associated with environmental security:

Thinking in terms of human security shifts the scale of analysis away from nations to the local level. It focuses on the immediate vulnerability of most of the world’s population, as opposed to hypothetical threats to nation-states. It provides a referent object which, when combined with environmental concerns, forms the basis for a new approach to environmental security.²¹⁷

The basic material needs required for human security – nutritious food, clean air and water, and shelter – require a healthy, functioning and resilient biosphere at the global level, and healthy, functioning and resilient ecosystems at the local level.²¹⁸

The provision of a healthy environment, therefore, not only enables the provision of the fundamentals of human and environmental security, but it also shifts the primary purpose of the state from violent protection (and subordination) of its citizens to an institution focused on the provision of their basic needs.²¹⁹ This means that “the state is a critical institution for the support of livelihoods”²²⁰ and plays an important role in creating the conditions in which people can pursue their desired livelihood options.

Having addressed the way in which human security understandings influence environmental security concerns, Barnett proposes a new definition of environmental security: “the process of peacefully reducing human vulnerability to human-induced environmental degradation by addressing the root causes of environmental degradation and human insecurity”.²²¹ In a separate article, Barnett defines environmental *insecurity* as: “the vulnerability of individuals and groups to critical and adverse effects caused directly or indirectly by environmental change”²²². These

²¹⁶ Tickner in Barnett, *The Meaning of Environmental Security*, 123-25.

²¹⁷ Barnett, *The Meaning of Environmental Security*, 127.

²¹⁸ Barnett, *The Meaning of Environmental Security*, 131.

²¹⁹ Barnett, *The Meaning of Environmental Security*, 128-29. See also: Benjamin Shephard, "Thinking Critically About Food Security," *Security Dialogue* 43, no. 3 (2012).

²²⁰ Jon Barnett and W. Neil Adger, "Environmental Change, Human Security, and Violent Conflict," in *Global Environmental Change and Human Security*, ed. Richard A. Matthew, et al. (Cambridge, Massachusetts: MIT Press, 2010).

²²¹ Barnett, *The Meaning of Environmental Security*, 129.

²²² Barnett, "Environmental Security and Peace," 5.

definitions are understandably anthropocentric, focusing on human vulnerability and insecurity and anthropogenic environmental degradation. It also dovetails easily into Dalby's theory of the "Anthropocene", suggesting that although, on the surface, the primary impacts studied in environmental security – such as scarcity of renewable resources and biodiversity loss – appear to be environmental problems, at their core, the majority of the negative environmental effects are in-fact human induced.

This definition must be read in conjunction with the definition of human security developed as an outworking of the Global Environmental Change and Human Security Project (GECHS), in which Barnett was also a participant. According to the GECHS definition, human security is something that is achieved:

...when and where individuals and communities have the options necessary to end, mitigate, or adapt to threats to their human, environmental, and social rights; have the capacity and freedom to exercise these options; and actively participate in pursuing these options.²²³

There are several important elements of this definition to keep in mind. Firstly, that the focus of human security – from an environmental change perspective – is on needs, rights and values. Secondly, human security is a variable condition where people have agency and the ability to participate in the management of their own human security. Finally, the definition relates to both individuals and communities, recognising that in many cultures, "the collective social group is of more value than the individual"²²⁴.

Barnett's definition focuses on risk and vulnerability and consequently these two ideas must be explored in more detail. According to Barnett, "environmental security is about risk, and risk needs to be democratically negotiated to determine the most urgent risks and the best ways of dealing with them"²²⁵. As a consequence, the risks of greatest concern to environmental security are those things which threaten the most basic elements of human security – that is, basic health needs such as clean water, sufficient nutritious food and a reasonable level of health and hygiene. These risks are the core concern for Barnett: "That one fifth of the world's people do not

²²³ Matthew et al., eds., *Global Environmental Change and Human Security*, 18.

²²⁴ Matthew et al., eds., *Global Environmental Change and Human Security*, 18-19.

²²⁵ Barnett, *The Meaning of Environmental Security*, 132.

have their basic health needs satisfied is the fundamental injustice with which this book is concerned. That these people are also extremely vulnerable to perturbations in weather or economics is also of great concern: these are risks proper"²²⁶.

The vulnerability that leads to this risk is a product of poverty, exclusion, marginalisation and inequities of material consumption. The corollary of this is that vulnerability occurs as a result of social, economic and political process, rather than simply due to processes of environmental change.²²⁷ Although environmental degradation and natural disasters are certainly variables that cause death and destruction, the most at risk to these perturbations are those who are most vulnerable due to poverty and inequity. Barnett uses the example of the cyclone that struck Bangladesh in 1991, resulting in an estimated 139,000 deaths. The vulnerability of those most affected by the cyclone was "fundamentally a function of poverty"²²⁸. The harm that *prima facie* was caused by the cyclone itself, is, on closer analysis, a form of structural harm otherwise known as structural violence.²²⁹

According to Barnett then, environmental security, is about people and politics.²³⁰ It is about people, in the sense that human security is fundamental to the construction of security that extends beyond simply the security of the state. It is also about people in that much of the transference of environmental harm from the North to the South is as a result of the consumer culture in the developed world – a culture that must be countered if the environmental security of millions in the developing world is to be enhanced.²³¹ This requires individuals in the North to take "conscious political actions...(which include) consuming less, consuming with greater discernment, and being more involved in actions at all scales from local to global for human and ecological causes"²³².

Environmental security is about politics inasmuch as it is often political decisions – or the lack thereof – that cause or exacerbate insecurity related to environmental

²²⁶ Barnett, *The Meaning of Environmental Security*, 131-32.

²²⁷ Barnett, *The Meaning of Environmental Security*, 132-33.

²²⁸ Barnett, *The Meaning of Environmental Security*, 133.

²²⁹ See: Barnett, "Environmental Security and Peace," 6; Johan Galtung, "Violence, Peace and Peace Research," *Journal of Peace Research* 6, no. 3 (1969): 170-71.

²³⁰ Barnett, *The Meaning of Environmental Security*, 141.

²³¹ Barnett, *The Meaning of Environmental Security*, 142-47.

²³² Barnett, *The Meaning of Environmental Security*, 146.

change. The global ecological crisis that the world is currently facing requires political solutions and “(t)he failure to act is therefore fundamentally a failure of politics and governance”²³³. Additionally, the problems associated with globalisation and industrialisation require enhanced forms of global governance that are able to regulate the environmentally socially harmful activities of multinational corporations.²³⁴ As Barnett concludes:

In the final analysis, enhancing environmental security involves no less than overcoming the negative aspects of modernity. This means thinking seriously about the nation-state and ways to reform it. It means resolving difficult issues to do with politics, justice, responsibility, diversity, and the situating and scaling of legitimate institutions of governance.²³⁵

Barnett’s conception of environmental security moves the referent object of security away from the state and firmly into the realm of human security. At the same time, he draws the discourse away from the ‘environment’ and towards the ecological. In doing so he indicates a systemic approach that focuses on the way that global processes impact on local environments and how this in turn impacts on individuals and communities. Although the state as the primary referent of security is dismissed, its important role in supporting individuals and communities is not.

Conclusion: Framing Environmental Security

ESS has had a haphazard development. From its beginnings based in the growing environmental movement of the 1970s, it has taken on a variety of different forms. Environmental security emerged as a broad idea concurrent with the splintering of security studies at the end of the Cold War. In its initial phases, a range of traditional security scholars attempted to understand how the environment would impact upon national security considerations. The ideas developed during the initial stage were tested in the second phase of ESS by large projects such as ENCOP and ECAC. These projects discovered more nuanced links between the environment and security but focused primarily on violent conflict and migration. In the third period of ESS, the suppositions of the first period were interrogated, in particular, the assumption that the state is the primary referent of security in an environmental

²³³ Barnett, *The Meaning of Environmental Security*, 140.

²³⁴ Barnett, *The Meaning of Environmental Security*, 155.

²³⁵ Barnett, *The Meaning of Environmental Security*, 160.

context. Throughout this period, the dominance of traditional security conceptualisations of environmental security was greatly reduced and generally replaced with a human security orientation.

The above literature review demonstrates clearly that there is no central premise to ESS and it therefore aids in answering the first research question of the thesis. Chapter three will use this knowledge to build on and consider *why* there is no central tenet to ESS. It will also use the literature review to assist in answering the second research question, by enabling an exploration of the similarities across the literature.

Chapter Two: Methodology

Simply inserting environmental factors into existing social scientific models is more problematic than recent researchers have recognised.

Daniel H. Deudney: *Contested Grounds*.²³⁶

Introduction

A strong methodology is particularly important in a thesis examining environmental security issues due to the multiple competing approaches and the potentially large scope of such an examination. Structuring the methodology, and therefore the thesis, around the aims outlined in the introduction, ensures that the methodological approach both marries with the research agenda and is well focused. This methodology chapter will therefore establish the elements necessary for providing a strong methodological examination of the research questions and a well-grounded theoretical exploration of the main premise of the thesis. The structure of the methodology chapter is as follows:

1. **Research Design:** Initially, the research design for the thesis will be explained, reviewing the research problem, the research objective, and the research questions. The statement of the thesis and the identification of the links between empirics and theory have already been outlined in the introduction.
2. **Thesis Scope:** Second, the scope of the thesis will be outlined, detailing what is to be studied in the Mekong River Basin.
3. **Epistemological Overview:** Third, the merits of the mixed methods or pragmatic approach will be discussed, with a focus on why the thesis is weighted towards the qualitative angle rather than quantitative.

²³⁶ Daniel H. Deudney, "Bringing Nature Back In: Geopolitical theory from the Greeks to the global era," in *Contested Grounds*, ed. Daniel H. Deudney and Richard A. Matthew (New York: State University of New York Press, 1999).

4. **Case Study Design:** Fourth, the case-study design will be outlined detailing the structure, variables and a justification of the case study.
5. **Data Collection:** The final part of the methods section will focus on the data collection techniques used in this thesis, and the rationale behind these.

Section 1: Research Design

The research design adopted in this thesis is based on the strategies outlined in both Yin's *Case Study Research: Design and Methods* and George & Bennett's *Case Studies and Theory Development in the Social Sciences*. The research design that follows has been based on the objectives specified by these researchers as important in establishing a sound case-study research design.²³⁷ It outlines the research problem, the research questions and objectives, and the statement of the thesis.

Research Problem

The scope and speed of environmental challenges today are immense. From changes in global environmental processes to disruption to ecological services at the local level, the large numbers of people that these currently impact, and are likely to impact in coming decades, is of deep concern. At risk is the stability of states, the functioning of national economies, the social cohesion of cities and communities, and the health and livelihoods of hundreds of millions of individuals. The lack of a coherent analytical framework through which to understand the security issues that are occurring as a result is highly problematic. Security studies in general, and the policy world that is informed by it, is poorer for the lack of this approach.

Arguably, environmental security has the potential to provide a way forward in understanding these environmental challenges and the security issues that arise as a result. The problem – as outlined in the introduction – is that there is no analytical bridge between the environment (environmental science), the state (traditional security and international relations) and the individual (human security). Much of the literature focuses on either the security of the state, or the security of individuals. Environmental security, therefore, is essentially an intersection of conflicting ideas from a range of disciplines. This is a problem because it hinders these complex real

²³⁷ Yin, *Case Study Research*, 21-28; Alexander L. George and Andrew Bennett, *Case Studies and Theory Development in the Social Sciences* (MIT Press, 2005), 73-87.

world environmental/social/political challenges and their impacts – such as climate change and large-scale ecological destruction – from being comprehensively understood from a security perspective. The sub-field of environmental security is arguably the theoretical lens that would enable such an understanding, yet because it is such a splintered notion – as outlined in the literature review – no such comprehensive understanding is available. As a result, national policymakers usually fall back on the traditional theories of realism and liberalism, and international policymakers either do the same, or subscribe to the human security discourse.

This means that environmental security – for all its potential to analyse these issues broadly – is unable to provide an analytical framework that would enable local, national and international policymakers to understand in greater detail the plethora of security issues linked to the complex challenges created by a rapidly changing environment. Furthermore, it appears that there is little concern that this is in fact the case. There is no attempt within the literature to conceive of environmental security in a united or coherent fashion and there has been no attempt to find a theme that links the disparate elements together.

Research Objective and Research Questions

The objective of the research is therefore to move towards resolving this problem. In this case, the analytical framework of Systemic Environmental Security has been forwarded as a potential solution. The primary objectives of the research are to initially understand the disparate nature of the environmental security literature, secondly, to discern the common theme within this literature, and finally, to determine how taking a systemic approach to environmental security differs from more standard approaches. It is intended that this will provide a stronger theoretical understanding and a more insightful approach to complex environmental security problems.

These objectives have been broken down into research questions that aid in quickly informing the research agenda of the thesis. Although they have already been outlined in the introduction, it is valuable to state them once again here at the beginning of the methodology:

1. Does environmental security have a central theoretical core that enables it to coherently analyse the linkages between security and the environment?
2. Is there a common theme that can be discerned within the literature on environmental security?
3. Does Systemic Environmental Security provide any unique insights into the relationship between security and the environment?

It is intended that in answering these three research questions, the research objectives for the thesis will be met.

Section 2: Scope and Security Perspective

As has been outlined in the introduction, the case study chapters focus on hydropower in the Mekong River Basin. For various reasons, this scope could be considered either too large or too narrow. This section justifies the scope of the thesis, discussing the somewhat broad focus on a single river system shared by five nation states, as well as the narrow concentration on only one environmental component – the negative effects of hydropower. The aim of this section is to justify the thesis's focus on hydropower development in the Mekong River Basin and arrive at a research agenda for the case-study that establishes a balance between being overly expansive – and therefore overly speculative and indeterminate – and being overly narrow – and therefore theoretically irrelevant.²³⁸

The Broader Environmental Context of the Mekong

From the perspective of the global biosphere, or the greater Asian region, examining the Mekong River Basin (MRB) is a comparatively much more manageable unit. Even so, the environmental issues in the MRB are expansive and are outlined below in order to demonstrate the way that the case-study subject matter has been narrowed. Climate change, in particular, is already having an impact on this region, particularly on hydrological processes. Four water related issues are particularly salient: flooding; storms; sea-level rise; and changes to precipitation – including drought.²³⁹

²³⁸ For a discussion of indeterminate research see: Gary King, Robert O. Keohane, and Sidney Verba, *Designing Social Inquiry: Scientific inference in qualitative research* (Princeton: Princeton University Press, 1994), 118-19.

²³⁹ The section that immediately follows is based on: Judy Eastham et al., "Mekong River Basin Water Resources Assessment: Impacts of Climate Change," in *CSIRO: Water for a Healthy Country National Research Flagship* (August 2008); "Impacts of Climate Change and Development on Mekong Flow Regimes: First

The natural flooding cycle is a vital element of life on the Mekong River as it interacts with fisheries and agricultural production and is generally welcomed by the population who have lived with this natural cycle for millennia. Flooding is particularly important to the Delta region as it brings crucial fertile silt to this agriculturally highly productive area keeping salinity levels down in the process. As the impacts of climate change have been making their presence felt throughout the MRB, the intensity and severity of flooding has increased, especially over the previous two decades. This is partly related to the second issue of monsoons and storms which are less welcome because the devastation that accompanies them can cause severe economic impacts and loss of life and livelihoods.

Changes in precipitation patterns also have obvious links with both flooding and storms given that precipitation is forecast to increase over coming decades. Although somewhat variable throughout the basin, the main changes associated with climate change and precipitation is an increased volume, but at less regular intervals. This means that one of the wettest places on the planet will also be threatened by drought over the coming decades, bringing with it severe consequences to livelihoods, especially at the Delta, where drought allows increased salinity intrusion. This then links with sea-level rise which is in part responsible for increased salinity in the Delta region as the sea gradually pushes inland and inundates farmland. Drought, which decreases flow from the Mekong and therefore decreases freshwater flow *out* of the Delta, interacts with sea-level rise which is simultaneously pushing salt water inland. The impacts of sea-level rise and salinity threaten to have the biggest impact on the Delta, because of the potential numbers of those displaced as well as the disruption to agricultural production that accompanies the increasing salinity.

Although the overview above is necessarily brief, what should be evident is the interactive nature of the impacts of environmental processes in the MRB. Changes in precipitation cannot be de-linked from flooding and storms. Additionally, drought often increases the impacts of salinity and, therefore, when drought or lower river flows and sea-level rise occur simultaneously, the impacts to agriculture can be devastating. These systemically linked issues further highlight the need for an understanding of environmental security from a systems thinking approach because,

assessment 2009," in *MRC Management Information Booklet Series*, ed. Robin Taylor and Hanne Bach (Vientiane: Mekong River Commission, 2011).

when drawn together, all the evidence points to a severe disruption to the water resources in a region where water is relied upon as the main element of subsistence through fisheries and agriculture.

These linked issues remain overly broad in scope for a thesis, however. Attempting to outline and explain the science behind them, and then to form a coherent theoretical analysis would result in the work becoming overly large and speculative. Focusing on only the impacts of hydropower development – which will be justified in more detail below – limits the analysis greatly and provides a much more manageable focus for the case-study chapters. Nevertheless, given that a systemic perspective is desired of this thesis, it is important to keep in mind that the water related issues identified above provide an important background and context to the research presented here.

Security Perspective

The process of elimination that limits the scope of the thesis to hydropower was far from arbitrary. The serious impacts of flooding, storms, drought, sea-level rise and salinity intrusion are without doubt impacting on the lives of millions in the region as well as national economies. What is more difficult to identify is a strong link to security in terms of both their impacts and their causes. In particular, it is difficult to discern the political element to these issues; the political arguably being one of the more important elements of any security analysis.²⁴⁰ To some degree there is a political element to the *impacts* of these environmental changes in that there is a degree of adaptation that occurs as a result of political decisions.²⁴¹ There is also the potential for longer term political impacts that may occur as many – especially within

²⁴⁰ Mohammed Ayoob, *The Third World Security Predicament: State Making, Regional Conflict, and the International System* (Boulder: Lynne Rienner, 1995), 8-9. Political here refers to the policies and actions of policy-makers at the local, state and international levels. Policy-makers may be elected or unelected government officials who have the ability to assert power and influence at the local, state or international levels through written or spoken policy.

²⁴¹ Tran Dinh Thanh Lam, "Vietnam: Rising Mekong Levels Test 'Living with Floods' Strategy," *Imaging Our Mekong*, 13 September, 2008: http://www.newsmekong.org/vietnam_rising_mekong_levels_test_living_with_floods_strategy.

the Delta – are forced to migrate due to salinity and sea-level rise making parts of the delta uninhabitable.²⁴²

In regards to the *causes* of these environmental issues, it is possible to consider the changes in climate that drive them as caused by the anthropogenic processes of modern industrial society and globalisation and the failure of the international community to achieve a workable carbon emissions reduction agreement.²⁴³ This would certainly introduce a political element, but result in lifting our level of political analysis from the local or regional to the global, and as a consequence would once again result in an unmanageable scope. Indeed, it is the difficulty in assigning causal blame for the global changes in climate that is at the very core of disagreements over carbon emissions reductions and this could no doubt be the subject of its own thesis.²⁴⁴ It is for these reasons that the four localised environmental issues, referred to above, have been discounted as potential research targets. That is to say, they have no immediately identifiable political element at the level of either cause or effect.

At this juncture, what is important to note is that the choice of hydropower projects in the Mekong River Basin as the focus of the case study chapters, is due to there being a closely related political element. As will become evident, the decision to construct hydropower dams occurs at a regional and national level and is often the focus of intense political scrutiny and debate. As for the impacts, these are at times more difficult to identify from a purely political perspective. As a consequence, the conception of security used here is more flexible than a singular focus on the political, affording a level of importance to social aspects of security – at the community and individual levels. This gives the thesis relevance at the level of both national security and human security. This important issue about the meaning of security – from a Systemic Environmental Security perspective – will be discussed in much greater detail in Chapter Three and the concluding chapters. It would be premature to do so here but suffice to say that for an issue to register as relevant to

²⁴² Christopher G. Baker, "Dams, Power and Security in the Mekong: A non-traditional security assessment of hydro-development in the Mekong River Basin," in *NTS Asia Research Paper No. 8* (Singapore: RSIS Centre for Non-Traditional Security Studies, 2012).

²⁴³ Dalby, "Ecology, Security, and Change in the Anthropocene."

²⁴⁴ David J Karoly, "The Blame Game: Assigning Responsibility for the Impacts of Anthropogenic Climate Change," *Climate Change and Social Justice* (2009).

environmental security, it must have: a) a political or economic cause; b) an environmental or ecological effect that has; c) a negative impact on the political or social level.

The Importance of Hydropower to the Mekong System

Just as there are a variety of different environmental issue areas related to climate change that have been identified, so there are a variety of localised, human-driven environmental issues that fit the causal description above. Such issues include deforestation, industrial pollution of waterways, overfishing, sand-dredging of the Delta and aquifer pollution.²⁴⁵ These issues were considered as potentially worthy of examination in this thesis, however, were excluded in order to keep the scope manageable. These issues therefore sit at the periphery of the thesis and, once again, provide the context for the environmental challenges in the region.

Hydropower development was chosen over the above potential candidates for one important reason: The most obvious environmental issue to consider in a river basin is water, and arguably the most pressing water issues in the MRB are those that are arising as a result of hydropower projects. Although hydropower developments are essentially engineering projects that are focused on creating energy and foreign income, they also come with severe 'externalities' similar to the externalities of air, ground and water pollution created by other industrial processes. These externalities are in the form of environmental and social impacts that have knock on effects to the security of people and possibly nations.²⁴⁶ These in turn have serious Hydropower development on the Mekong therefore provides a rich source of data to facilitate the exploration of the idea of Systemic Environmental Security.

²⁴⁵ For a more detailed discussion see: Mira Käkönen, "Mekong Delta at the Crossroads: More Control or Adaptation?," *AMBIO: A Journal of the Human Environment* 37, no. 3 (2008); "Vietnam's Mekong Delta Pays Huge Ecological Toll for Agricultural Boom," *Thanh Nien News*, June 15, 2014: <http://www.thanhniennews.com/society/vietnams-mekong-delta-pays-huge-ecological-toll-for-agricultural-boom-27251.html>; Jeanna Hyde Hecker et al., "Environmental Security Assessment - Mekong River Basin: Case Study of the Nam Can District, Vietnam," in *Programme on Environmental Security for Poverty Alleviation (ESPA)* (The Hague: Institute for Environmental Security, 15 January, 2011).

²⁴⁶ Externalities are understood as "costs external to the project or economic activity in question in the sense that they are borne by individuals and communities other than those reaping the benefits." From: Philip Hirsch and Carol Warren, *The Politics of Environment in Southeast Asia: Resources and Resistance* (New York: Routledge, 2002), 12. See also: Jeroen C. J. M. van den Bergh, "Externality or Sustainability Economics?," *Ecological Economics* 69, no. 11 (2010). See also: Evelyn Goh, "Developing the Mekong: Regionalism and Regional Security in China-Southeast Asian Relations," *Adelphi Series* 46, no. 387 (2006): 9.

It is important to note that a strong argument can be made for continuing the honing down process from the level of a river basin. The MRB, for example, is home to around 60 million people covering an area of 795,000 km² and the river is shared by six discrete nation states.²⁴⁷ Studying such a large area covering a handful of states remains problematic given the overly expansive research area and the mind-boggling number of possible variables. The argument is valid but can be countered in part by considering the MRB not as a political unit, but as an ecological one. For example, the Mekong delta in southern Viet Nam – sometimes referred to as the ‘rice-bowl of Asia’ – is at significant risk from hydropower projects for a number of reasons. In terms of hydropower, one of the greatest risks to the Delta is from the Lancang Dam Cascade in the upper, Chinese section of the river, thousands of kilometres away. As will be demonstrated in Chapter Four, the silt captured behind these dams is having a significant impact on the fertility and survival of the delta – interacting with the problems already occurring from sea-level rise and salinity intrusion. This fact is seldom – if ever – recognised by Chinese authorities due to the state-based thinking that dams are state-owned and operated and, therefore, the impacts that occur as a result of their construction are only a concern if they impact on the state that own and operate them.

This state-based thinking runs counter to a systemic approach that recognises ecosystems as ecosystems rather than as political units to be conquered and divided. Rivers are unique and interdependent ecosystems where changes in one section can have significant impacts in another section thousands of kilometres away. Studying the delta in isolation, for example, is analogous to a surgeon, in trying to diagnose the numbness in a foot, only examining the foot, whilst ignoring an injury to the upper spine; or a mechanic attempting to discover the cause of black smoke emitting from the tailpipe who only examines the exhaust. The Mekong River Basin is an ecosystem, and like the parts of the body, or the functioning of a car, in order to understand the symptoms in one area, an understanding of the total system is crucial. This is the purpose and power of Systemic Environmental Security. For this reason, it is vital – if anything is to be learned about SES in the MRB – to study the system, not simply the artificial political division and units that have been assigned to the geography over the centuries.

²⁴⁷ "State of the Basin Report 2010 (MRC SOB 2010)," (Vientiane: Mekong River Commission, April, 2010).

Nevertheless, in a complex ecological-political system such as the MRB, without a clear research agenda, it is easy to become overwhelmed by the sheer volume of data generated in the research process.²⁴⁸ In order to avoid this situation, this section of the methodology has systematically narrowed the scope of the thesis so that it is sufficiently limited so as not to be overly speculative and inclusive but not throttled to the extent that the thesis is overly narrow and therefore uninformative to the literature on environmental security more generally.²⁴⁹ The scope has been narrowed from the global to the regional and from the regional to a single river system. From the large range of potential climate related and human induced environmental challenges across the river basin one has been chosen: Hydropower construction. This was chosen because it strongly links the political with the environmental and social. Section four below will outline in even greater detail the more specific case study methodology which further defines and confines the scope of the study. Having now established the scope, the following section will provide even greater detail on the methodological approach of the thesis.

Section 3: Epistemological Approach – Combining quantitative and qualitative research in a mixed methods or pragmatic approach

A researcher's epistemology will have a strong influence not only on their research agenda, but also on the way that they present their findings. As will become evident throughout the literature review, environmental security studies exhibits a wide range of approaches across the full spectrum of scientific and social science research strategies. On one end is Gleiditsh's quantitative research based on a positivist epistemology; towards the middle is Homer-Dixon and Kahl who focus on empirical sense-making through theory generation; and at the other end of the scale is Dalby's critical ecology leaning towards Foucauldian deconstruction and the Copenhagen School's critical security ethic.²⁵⁰ The absence of a single theoretical core to environmental security means that there is no ready-made methodological approach

²⁴⁸ Kathleen M. Eisenhardt, "Building Theories From Case Study Research," *Academy of Management Review* 14, no. 4 (1989): 536.

²⁴⁹ For a discussion of the importance of scale see: David Delaney and Helga Leitner, "The Political Construction of Scale," *Political Geography* 16, no. 2 (1997); Matthew Wheatley and Chris Johnson, "Factors Limiting Our Understanding of Ecological Scale," *Ecological Complexity* 6, no. 2 (2009).

²⁵⁰ See for example: Gleditsch et al., "Conflicts over Shared Rivers."; Homer-Dixon, "Environmental Scarcities."; Colin Kahl, "Demographic Change, Natural Resources and Violence: The Current Debate," *Journal of International Affairs* 56, no. 1 (Fall 2002); Dalby, "Environmental Security: Ecology or International Relations?."

to take, indicating that another way must be found. It is therefore the aim of this section to clarify the epistemological approach taken in this thesis. This will be achieved in two ways: Firstly, the difficulties of, and reasons to avoid using a theoretically siloed research agenda will be discussed. Secondly, the pragmatic or mixed methods approach will be introduced as well as the justification of its use, focusing on the importance of balancing qualitative and quantitative research.

Avoiding Theoretical Siloes in Environmental Security Research

Far from simply and objectively searching for causes and relationships, a great deal of research begins with an epistemological paradigm and works toward a problem, analysing the problem or question from that perspective. Political Ecology, which is discussed in detail in the literature review, is a good case in point, explicitly calling for research to be based “on a theory of social transformation or political economy”²⁵¹. This practice of anchoring research in a specific epistemological approach is particularly true for international relations and security studies which tend to divide into competing “isms”.²⁵²

Although it has merit in that it enables the researcher to stay close to a well-defined research agenda and discount data unimportant to the chosen theoretical approach, it also has some obvious drawbacks in that a researcher may discount or miss relevant evidence due to the deliberately siloed approach. Furthermore, it has the tendency to be self-reinforcing rather than methodologically valid because it risks hampering the production of new ideas and the development of new and novel theory.²⁵³ Given that the aim of the thesis is to re-evaluate the environmental security discourse, it is important that the epistemological approach here does not favour one theory over another. To do so would demonstrate bias and skew the analysis. Favouring either realism or human security, for example, is going to have an obvious impact on the findings. To do so would compromise the objectivity and integrity of the research in that it would run the risk of discounting or missing relevant evidence to theory and practice. Consequently, a different approach to research must be found; one that enables a wider view of theory.

²⁵¹ Peluso and Watts, eds., *Violent Environments*, 18-20.

²⁵² George and Bennett, *Case Studies and Theory Development*, 127-28.

²⁵³ George and Bennett, *Case Studies and Theory Development*, 128-29.

The Mixed Methods Approach

For this reason, this thesis sits within what Creswell refers to as a “pragmatic knowledge claims” or a “mixed methods” approach based on the idea that “the problem is most important, and researchers use all approaches to understand the problem”²⁵⁴. In a mixed methods approach the philosophical assumptions are secondary to the problem itself. “Pragmatism is not committed to any one system of philosophy and reality” and researchers are able to “choose the methods, techniques and procedures of research that best meet their needs and purposes”²⁵⁵. A researcher employing the mixed methods approach therefore aims “to capture a complete, holistic picture of the subject matter, presumably with a view to uncovering something that might have been missed with a simpler research design”²⁵⁶. This is an important element of this thesis, given the need to understand both theory and empirics. In order to understand environmental security problems, a researcher must have a knowledge of various security theories, as well as knowledge of the scientific literature as it pertains to the specifics of the case.

One of the strengths of the mixed methods approach is that it combines both qualitative and quantitative research in order to answer the research question as effectively as possible.²⁵⁷ This is vital to any study of the links between the environment and security given that security studies tends to be qualitative in nature, and that the environmental links or causes of insecurity generally sit within a scientific or quantitative paradigm. By combining both qualitative and quantitative data, the mixed methods approach challenges the more stringent ideals of the binary either/or approach of qualitative and quantitative research – fields of enquiry that have been described as “at war”²⁵⁸.

As already eluded to, the work of Gleiditsch provides a strong demonstration of the quantitative approach in environmental security studies. Quantitative research tends to be focused on probability and statistical theory, using large data sets and multiple

²⁵⁴ John W Creswell, *Research Design: Qualitative, quantitative, and mixed methods approaches* (Thousand Oaks: Sage Publications, 2013), 11.

²⁵⁵ Creswell, *Research Design*, 12.

²⁵⁶ Leila Hurmerinta-Peltomäki and Niina Nummela, "First the Sugar, Then the Eggs... or the Other Way Round? Mixing methods in international business research," *Handbook of qualitative research methods for international business* (2004): 164.

²⁵⁷ Creswell, *Research Design*, 18-20.

²⁵⁸ King, Keohane, and Verba, *Designing Social Enquiry*, 3.

duplicatable experiments to test a theory or causal hypothesis. This enhances the verifiability and maximises the generalisability of the theory.²⁵⁹ Quantitative research “tends to be based on numerical measurements of specific aspects of phenomena”²⁶⁰. Ideally, this is to be achieved under controlled circumstances, as an experiment to test the independent variables of a theory in order to observe the outcome.²⁶¹ As far as the specific single experiment or case is concerned, a quantitative researcher is less interested in this than the generalisable outcomes of multiple experiments or cases. Anomalies are not treated as causes for investigation, and are often treated as statistical error. Mahoney and Goertz describes this as “the effects-of-causes approach”²⁶².

On the other hand, one of the main concerns of a qualitative research is to discover, retrospectively, what causal process led to a given outcome. For example, attempting to “identify the causes of World War I, exceptional growth in East Asia (or) the end of the Cold War”²⁶³ are sensible questions for a qualitative researcher. This is the “causes-of-effects approach”: the outcome is known, but the reason or reasons for the outcome are not. Individual cases tend to provide stronger explanatory power due to the ability of the researcher to more deeply examine the causes of the effect. Cases tend to be selected on the dependent variable, and cases that are an exception to the rule require examination and explanation, often leading to a revision in theory.

In relation to the mixed methods approach, this thesis is more heavily weighted towards qualitative research and analysis given that it incorporates a detailed case-study that is concerned with explanation and specific detail rather than generalisability and duplication. Using a quantitative approach such as that forwarded by Gleditsch would act as a “methodological straightjacket (that would serve to) severely constrain research in the field”²⁶⁴. The impact of hydropower in the

²⁵⁹ James Mahoney and Gary Goertz, "A Tale of Two Cultures: Contrasting quantitative and qualitative research," *Political Analysis* 14, no. 3 (2006): 229.

²⁶⁰ King, Keohane, and Verba, *Designing Social Enquiry*, 3.

²⁶¹ Mahoney and Goertz, "A Tale of Two Cultures," 230.

²⁶² Mahoney and Goertz, "A Tale of Two Cultures," 231.

²⁶³ Mahoney and Goertz, "A Tale of Two Cultures," 230.

²⁶⁴ Daniel M. Schwartz, Tom Deligiannis, and Thomas Homer-Dixon, "The Environment and Violent Conflict: A Response to Gleditsch's Critique and Some Suggestions for Future Research," *Environmental Change and Security Project Report* 6(Summer 2000): 78.

Mekong River Basin on security is the primary focus of the case-study and it is acknowledged from the beginning that this research and its findings are not designed to be generalisable to all cases related to environmental security, nor all cases related to hydropower development. Nevertheless, it is hoped that the empirical research informs the theoretical research and that more can be learned about the nature of environmental security from this single, focused case-study than from a statistical aggregation of data related to hydropower and violent conflict, for example. This will be discussed in more detail in section four, below, outlining the details of the case-study.

What is important in relation to the mixed methods approach is that it is a pragmatic research design that facilitates research into real world problems without having to be anchored to any particular epistemological paradigm. On this point, Dubois and Gadde posit that “(t)he main objective of any research is to confront theory with the empirical world”²⁶⁵. This is an iterative process and is described more effectively by Ragin who states that “(a)s researchers our primary goal is to link the empirical and the theoretical – to use theory to make sense of evidence and to use evidence to sharpen and refine theory. This interplay helps us to produce theoretically structured descriptions of the empirical world that are both meaningful and useful”²⁶⁶. This, primarily, is the aim of this thesis, which initially overviews the environmental security literature in detail, followed by a case-study that confronts this literature with a real world problem, then returning to a theoretical analysis of the findings of the case-study, positing what this means to theory more broadly.

What is important to note is that in this thesis, the research question drives the epistemological agenda rather than vice versa. In this sense the research is neither positivist nor post-positivist.²⁶⁷ There is no attempt to try to ‘prove’ a particular branch of international security right or wrong as such, nor to be strictly tied to any particular

²⁶⁵ Anna Dubois and Lars-Erik Gadde, "Systematic Combining: an abductive approach to case research," *Journal of business research* 55, no. 7 (2002): 555.

²⁶⁶ Charles C. Ragin, "'Casing' and the Process of Social Inquiry," in *What is a Case? Exploring the foundations of social inquiry*, ed. Charles C. Ragin and Howard S. Becker (Cambridge: Cambridge University Press, 1992), 224-25.

²⁶⁷ The idea of positivism in this context is taken from Smith who states: "Positivism has involved a commitment to a unified view of science, and the adoption of methodologies of the natural sciences to explain the social world." See: Steve Smith, "Positivism and Beyond," in *International Theory: Positivism and Beyond*, ed. Steve Smith, Ken Booth, and Marysia Zalewski (Cambridge: Cambridge University Press, 1996).

theoretical paradigm. Confining the thesis to a single school of thought would essentially defeat the purpose of the research. The main purpose is to understand how approaching security issues related to the environment in a systemic way reveals different insights into environmental security.

Section 4: Case Study Design

A good case study design is important in order to achieve a sound overall research design. This section will overview the case study structure, the research questions specific to the case, and the importance of understanding the tension between single and multiple cases.

Case Study Structure

As already outlined in the introduction, the case study will be broken into two chapters. The first chapter – Chapter 4 – will take a macro approach, examining the Lancang Cascade built on the Chinese section of the Mekong mainstream and its contribution to environmental issues that cross national boundaries. The second chapter – Chapter 5 – will take a micro perspective, looking at a single dam within a single nation, the Nam Thuen 2 Dam in central Laos.

Case Study Research Question

Of the three research questions set out above, the most relevant to the case study chapters is the third question that seeks to understand the unique insights that arise when using a Systemic Environmental Security approach. The first two questions regarding the disparate nature of environmental security are more theoretical in nature and are based on a sound knowledge of the literature. It is the third question, therefore, questioning the relationship between security and the environment that will have the most pertinence to the empirical chapters.

The Mekong River Basin as a System: The power of the single ‘N’

There is controversy and debate in case study methodology theory about the number of cases that should be selected. Some theorists suggest that multiple comparative case studies, because they are more readily generalisable, are the only way to gain valuable knowledge about causal processes. Others believe that a single case can provide rich sources of data on which to base strong theoretical conclusions. Given that the empirical section of this thesis uses a single case, viewed from a macro and a micro perspective, it is important to understand how this

fits into this wider methodological debate. This section of the methodology therefore justifies the use of a single case, rather than a multiple case study comparison.

The wider epistemological debate surrounding case study research revolves around how the desired ends inform the means. If the desired outcome is that the case study or studies are to be generalisable, then a multiple “N” case study (many comparable cases) is usually desired. In contrast, if a depth of analysis is desired for a richer understanding of the case involved, then a single “N” case study meets the criteria. In this sense, the tension “between specificity and generalisability”²⁶⁸ is similar to the difference between qualitative and quantitative research. The work of Gleditsch, to be detailed in the literature review, exemplifies the quantitative point of view. In his study of shared river boundaries, he uses a dataset of 250 river basins examining a single dependent variable, the “onset of militarised interstate disputes”²⁶⁹. His language is typical of quantitative research, referring to “regression analysis”, “positively related” variables, and “probability of conflict”. This is what Homer-Dixon refers to as *correlational analysis*.²⁷⁰ While quantitative findings may be informative in a general sense, they provide only limited value to a researcher wishing to know about specific conditions in a single river basin.

The general nature of quantitative and positivist research contrasts with the depth of knowledge required for a more geographically specific understanding, and indicates why a case study – rather than a quantitative analysis – is warranted when researching the Mekong River Basin. It is possible, however, to have a positivist outlook whilst doing qualitatively based, case study research. Mitchell and Bernauer for example, have strong foundations in the positivist mindset and take their cue from Popper’s falsification thesis.²⁷¹ In their opinion, “drawing valid and unambiguous conclusions about a single causal claim contributes more to our knowledge...than research that more boldly attempts to evaluate many causal claims but that uses an indeterminate research design with insufficient cases to validly substantiate any of

²⁶⁸ Ronald Mitchell and Thomas Bernauer, "Empirical Research on International Environmental Policy: Designing qualitative case studies," *The Journal of Environment & Development* 7, no. 1 (1998): 13.

²⁶⁹ Gleditsch et al., "Conflicts over Shared Rivers," 367.

²⁷⁰ Thomas F. Homer-Dixon, "Strategies for Studying Causation in Complex Ecological-Political Systems," *The Journal of Environment & Development* 5, no. 2 (1996): 141.

²⁷¹ Mitchell and Bernauer, "Empirical Research," 11.

the claims”²⁷². A case, therefore, is “a phenomenon for which we report and interpret only a single measure of any pertinent variable”²⁷³. This positivist view holds that an independent variable can and must be isolated in order to study its causal relationship with a dependent variable. The assumption here is not only that the independent variable *can* be separated clearly in a real-world setting, but that there are *no other variables* that may be intervening in the causal process. Only in this way, could a researcher claim “unambiguous conclusions” about a knowledge claim. By Mitchell and Bernauer’s own admission, “the real world often fails to offer up cases that fit these demanding criteria”²⁷⁴. Indeed, it is difficult to know how any sophisticated theory could be developed based on these strict criteria, nor how anything with complex causal pathways could be researched. According to Mitchell and Bernauer, therefore, a minimum of four case studies would be required to examine the single independent variable.²⁷⁵ Their case study methodology is much closer to that which is found in the physical sciences and, in the case of this thesis, is unhelpful.

Eisenhardt, although describing her own approach to case studies as “a positivistic view of research”, is more concerned about theory generation than tracing causal processes: “theory building research is begun as close as possible to the idea of no theory under consideration and no hypotheses to test”²⁷⁶. In her opinion “the process (of case study research) is directed toward the development of testable hypotheses and theory which are generalisable across settings”²⁷⁷. Although she believes that case study research is a strategy that focuses on “the dynamics present within *single* settings”²⁷⁸ she also holds that in order to create good theory from case study research, “between 4 and 10 cases usually works well”. This is because “(w)ith fewer than 4 cases, it is often difficult to generate theory with much complexity, and...(w)ith

²⁷² Mitchell and Bernauer, "Empirical Research," 14. See also: King, Keohane, and Verba, *Designing Social Enquiry*, 100-01.

²⁷³ Mitchell and Bernauer, "Empirical Research," 15.

²⁷⁴ Mitchell and Bernauer, "Empirical Research," 17.

²⁷⁵ Mitchell and Bernauer, "Empirical Research," 15.

²⁷⁶ Eisenhardt, "Building Theories," 536.

²⁷⁷ Eisenhardt, "Building Theories," 546.

²⁷⁸ Eisenhardt, "Building Theories," 534. (my emphasis)

more than 10 cases, it quickly becomes difficult to cope with the complexity and volume of the data”²⁷⁹.

There are several assumptions in operation in Eisenhardt’s work: firstly, that the main purpose of case study research is to build theories; secondly, that theory building is done in some sort of vacuum, starting from a theoretical *tabula rasa*; thirdly, that case studies should be generalisable; and finally, implicit within this worldview is the belief that a single case study is not sufficient to create theory relevant to a larger universe. In regards to points one and two, it is clear that the case study in this thesis is not simply about creating a testable hypothesis within a theoretical vacuum – if indeed this is possible. It falls somewhere between Mitchell and Bernauer, and Eisenhardt, in that, although there is an element of theory testing involved, there is still opportunity for theory building and modification. In regards to the possibility of generalisability, this thesis does not propose that the case of the Mekong is necessarily generalisable to other large river systems. Nevertheless, understanding the way that hydropower development interacts with environmental security will very likely provide key insights into, and raise important questions about other large river basins. This speaks to the final point: insights from this single case are likely to have relevance in other contexts.

Yin also believes that multiple case studies are preferable and that if large “N” studies are not possible, even a “two-case” case study will yield better results. His argument is that “(i)f under...varied circumstances you still can arrive at common conclusions from both cases, they will have immeasurably expanded the external generalisability of your findings”²⁸⁰. Yin compares case studies to experiments: “the ability to conduct 6 to 10 case studies, arranged effectively within a multiple case design, is analogous to the ability to conduct 6 to 10 experiments on related topics”²⁸¹. This view, once again, leans towards a positivist mindset, aiming for generalisability across cases rather than searching for unique insights. Yin, however, appears to understand that the real world cannot be controlled in a similar way to an experiment. In his opinion a case study is needed when “a ‘how’ or ‘why’ question is

²⁷⁹ Eisenhardt, "Building Theories," 545.

²⁸⁰ Yin, *Case Study Research*, 53.

²⁸¹ Yin, *Case Study Research*, 47.

being asked about a contemporary set of events, over which the investigator has little or no control”²⁸².

Perhaps this is why Yin concedes that there are occasions where a single case is warranted: the case may be a *critical* case in testing a well formulated theory; an *extreme* or *unique* case; a *representative* or *typical* case; a *revelatory* case; or a *longitudinal* case.²⁸³ In regards to Yin’s account, the situation in the Mekong River Basin is a *critical* case. According to Yin, if a “theory has specified a clear set of propositions as well as the circumstances within which the propositions are believed to be true (then)...(t)o confirm, challenge, or extend the theory, a single case may meet all of the conditions for testing the theory”²⁸⁴. The research design above has outlined how this thesis will challenge and extend the environmental security literature by examining the case study of the Mekong River Basin from a Systemic Environmental Security perspective.

There are more substantial reasons for choosing a single case than simply thinking of it as a critical case. Dyer and Wilkins criticise Eisenhardt’s use of 4 to 10 cases describing it as “cases study” rather than case study research. In their opinion, Eisenhardt loses the essence of what constitutes case study research: “the careful study of a single case that leads researchers to see new theoretical relationships and question old ones”²⁸⁵. They refer to the specificity versus generalisability dualism, indicating that a researcher must choose between “deep understandings of a particular social setting and the benefits of comparative insights”²⁸⁶. They strongly advocate a single case study approach because this allows a researcher to “understand and describe the context of the social dynamics...(and) to make the context intelligible to the reader and to generate theory in relationship to that context”²⁸⁷. Accordingly, “(t)heory that is born of such deep insights will be both more accurate and more appropriately tentative because the researcher must take into account the intricacies and qualifications of a particular context”²⁸⁸. This stands in

²⁸² Yin, *Case Study Research*, 9.

²⁸³ Yin, *Case Study Research*, 38-42.

²⁸⁴ Yin, *Case Study Research*, 40.

²⁸⁵ W Gibb Dyer and Alan L Wilkins, "Better Stories, Not Better Constructs, to Generate Better Theory: A rejoinder to Eisenhardt," *Academy of Management Review* 16, no. 3 (1991): 614.

²⁸⁶ Dyer and Wilkins, "A Rejoinder to Eisenhardt," 614.

²⁸⁷ Dyer and Wilkins, "A Rejoinder to Eisenhardt," 616.

²⁸⁸ Dyer and Wilkins, "A Rejoinder to Eisenhardt," 615.

stark contrast to the positivist claims that replicatability and generalisability lead to more accurate knowledge claims.

Ragin expands on this idea, explaining that case-oriented researchers “treat cases as singular, whole entities purposefully selected, not as homogenous observations drawn at random from a pool of equally plausible selections”²⁸⁹. Accordingly, case study researchers “study the cases they do because these cases are historically, politically, or culturally significant in some way”²⁹⁰. This moves case study research away from variable oriented theory testing and towards research able to cope with specificity and more complex causal dynamics. In this way, case study research is better placed to understand “the empirical world (that) is limitless in its detail, complexity, specificity, and uniqueness”²⁹¹.

Homer-Dixon refers to the difficulties in studying complex ecological-political systems in his methodological paper on the issue:

The systems under study are characterised by an immense number of unknown variables and unknown causal connections between these variables, by interactions, feedbacks, and nonlinear relationships, and by high sensitivity to small perturbations. Such complexities and uncertainties make it virtually impossible to choose cases that control for potentially confounding variables... Highly complex systems also present problems for controlled case comparisons. Such an approach, which, ideally, varies cases on the independent variable, is appropriate only if the researchers can be sure that all other variables...are controlled. Then they can see what happens with the sole difference of variation in the independent variable.²⁹²

On this basis, the Mekong River Basin, which is clearly a complex ecological political system, does not warrant comparative cases in order to meet the research goals of the project. It is difficult to see how, in such a complex system, a series of controls could be established that account for all the possible variation.

The study of the Mekong River Basin is an important case-in-point in regards to the specificity versus generalisability debate. Attempting to understand the complex

²⁸⁹ Charles C. Ragin, "Turning the Tables: How Case-Oriented Research Challenges Variable Oriented Research," *Comparative Social Research* 16(1997): 30.

²⁹⁰ Ragin, "Turning the Tables," 31.

²⁹¹ Ragin, "Casing," 217.

²⁹² Homer-Dixon, "Strategies for Studying Causation," 133 and 44.

security concerns surrounding hydropower dams, the resource scarcity of water, soil, and fisheries, and the outcomes related to environmental security, demonstrate the difficulties of a positivistic approach to complex ecological-political systems. It may be possible to compare the Mekong, as a river basin, with other river basins, in terms of hydrology and ecology – although this is surely contentious – however, once we include the political and social layers, keeping in mind that the river is shared by six riparian states, with a population of around 87 million, a level of complexity arises that is difficult to manage in and of itself, let alone attempting to compare and contrast this with other river basins.

Although there is hydropower development occurring throughout Asia, and there are certainly some similarities between some of these and the Mekong, in order to compare and contrast, a researcher would have to identify these similarities and focus on them to give some meaning to the comparison. In doing this, the depth of research must necessarily be throttled in favour of width, the more so, the more cases added to the study. Although this would allow the researcher to code the data and search for cross case patterns, important understandings – such as the specific political and social environment – would need to be significantly simplified due to the necessity of keeping the research and data manageable. In doing this, the research risks being “hollowed out” in favour of less specific knowledge claims that are perhaps more generally accurate to river basins with hydropower, but less accurate to the Mekong and undoubtedly less insightful in terms of the Mekong system as a whole. A more specific knowledge of the environmental, social, and political factors surrounding the case is favourable because it gives the researcher a much richer platform on which to test and build stronger theory, and it allows the reader a deeper understanding about how the conclusions were arrived at.²⁹³

Case Selection and the Insights of the Negative Case

In addition to choosing the number of cases, deciding whether to select a “positive” case – one with the presence of the dependent variable – or a “negative” case – a case in which the dependent variable is absent – is an important part of case selection. As will be outlined in the following chapter, much of the environmental security literature revolves around whether environmental scarcities lead to violent

²⁹³ Dubois and Gadde, "Systematic Combining," 558.

conflict. This is because the most well developed theoretical framework associated with environmental security – that of Homer Dixon – suggests that there are links between the two. However, in relation to the Mekong there is no conflict between nations and no violent conflict that appears to be linked with the resource scarcity and environmental changes that have been brought about as a result of hydropower construction. This means that in regards to the environmental scarcities and violent conflict framework *and* traditional security considerations of conflict between states, there does not appear to be anything of major concern.²⁹⁴ The choice to use the Mekong therefore – and to focus specifically on hydropower – means that the case is essentially a negative one.

Much of the criticism of Homer-Dixon's work is based around the fact that he selected cases on both the independent and dependent variables.²⁹⁵ Levy suggests that one way of overcoming this is to research societies facing similar levels of environmental scarcities, but with differing levels of violent conflict.²⁹⁶ Levy's analysis stems from the national security literature and a traditional view of security. The dependent variable, violent conflict, remains the main point of interest in his view and his assumption is that similar levels of environmental scarcities *will* cause, or contribute to, various levels of violent conflict. His research agenda does not consider negative cases, only differing levels of positive outcomes.

Homer-Dixon defends his decision to select cases based on both the independent and dependent variables as part of a strategy of attempting to determine if these variables are causally linked. This method, referred to as *process tracing*, is particularly helpful during the early research phase of a given subject and aligns itself reasonably well with Eisenhardt's view that the purpose of case studies is to build and test theory.²⁹⁷ Ragin agrees that selecting positive cases is a worthwhile endeavour, criticising "simple minded" statistically-based critiques of positive case selection.²⁹⁸ His argument is that in order to select negative cases, a body of positive

²⁹⁴ This will be made clear in Chapters Four and Six.

²⁹⁵ See for example: Homer-Dixon, "Strategies for Studying Causation."; Gleditsch and Urdal, "Ecoviolence?."

²⁹⁶ Levy, "Time for a Third Wave?", 57. This obviously assumes that finding similar cases is possible. See: Barnett, *The Meaning of Environmental Security*, 63.

²⁹⁷ Homer-Dixon, "Strategies for Studying Causation," 133, 40-41. Homer-Dixon's version of process tracing is somewhat different to that of King, Keohane, and Verba: King, Keohane, and Verba, *Designing Social Enquiry*, 227.

²⁹⁸ Ragin, "Turning the Tables," 34-35.

cases – that have enabled the development of a theory – already need to exist. Indeed, it is the series of positive case studies on environmental scarcities and violent conflict that have already been carried out which facilitate the use of the negative case in this thesis. The absence of violent conflict in the Mekong, in the presence of the environmental changes that are occurring due to hydropower is of considerable interest.

To counter the selection of positive cases, Gleditsch and Urdal suggest examining cases without conflict or cases “likely to explode in the near future”²⁹⁹. As is consistent with their positivistic outlook they link back to the quantitative, multiple case method as discussed above. Similarly, Barnett states that a “more revealing strategy” is to examine cases without violent conflict; although his motives for this suggestion are far from quantitative.³⁰⁰ In his opinion, this would “shift the emphasis away from reaction to adaptation”³⁰¹. He is critical of attempts to explain these complex issues using positivist research strategies and suggests that a more normative approach is needed focusing on “the day-to-day insecurities associated with the erosion of individual and group welfare and resilience”³⁰². In this regards, this thesis aligns itself more with Barnett’s suggestion that unique security insights can be gathered from a negative case, or one without violent conflict.

As already indicated, selecting a negative case is certainly similar to a positivist approach in that rather than process tracing from causes to effects, the study is more closely linked to the ‘effects of causes’. Even so, it is dissimilar from positivist methodology in that it is not an experiment; there is no control, and the variables cannot be manipulated given the case study is a real world scenario. Although the evidence used is a mix of qualitative research and quantitative data, it must be reiterated that the analysis is strongly qualitative.

Case Study Design Conclusion

Given the aims of this thesis and the complexity of the ecological-political system of the Mekong River Basin, a strong case study research design is essential. The above case study design section has outlined the case study structure in terms of a

²⁹⁹ Gleditsch & Urdal 295-296

³⁰⁰ Barnett, *The Meaning of Environmental Security*, 63.

³⁰¹ Barnett, *The Meaning of Environmental Security*, 63.

³⁰² Barnett, *The Meaning of Environmental Security*, 64.

macro and micro analysis, introduced the limitations of variable oriented testing to the overall research design, explained and justified the use of a large single case study, and framed the case as a negative case in the context of the preceding literature on the subject. It is intended that this well considered case study design will provide the overall research agenda with a strong empirical foundation on which to re-evaluate the environmental security literature and develop the idea of Systemic Environmental Security.

Section 5: Data Collection

One of the most important strategies in a mixed methods case-study approach is the use of triangulation.³⁰³ Triangulation enables the researcher to view the problem from different perspectives through multiple data collection techniques. The data collection techniques used in this thesis can be broken down into four elements: the literature review; interviews; document analysis; and media coverage. This section overviews these data collection techniques.

Literature Review

The literature review for this thesis is roughly broken into two component parts, one looking at theoretical perspectives on environmental and international security, and the other overviews the literature more specifically relevant to the Mekong river basin and the environmental changes occurring there. In regards to theoretical perspectives, the relevant academic journals on the subject were examined, as well as monographs, edited books and textbooks from a wide range of sources and authors. Chapters Two and Three contain the majority of reviewed theoretical literature and form the basis for the re-evaluation of environmental security.

Gathering Mekong specific literature required a wider cross-disciplinary search, not necessarily specific to security issues. This included literature from human geography, hydrology, agricultural sciences, climate sciences and other environmental sciences relevant to food, water and hydropower. In addition to the scientific literature, social and political discourse on the Mekong was also explored in

³⁰³ Hurmerinta-Peltomäki and Nummela, "First the Sugar," 164-65; Todd D. Jick, "Mixing Qualitative and Quantitative Methods: Triangulation in action," *Administrative science quarterly* (1979); Karsten Jonsen and Karen A. Jehn, "Using Triangulation to Validate Themes in Qualitative Studies," *Qualitative Research in Organizations and Management: An International Journal* 4, no. 2 (2009): 124; Gary King, Robert O Keohane, and Sidney Verba, "The Importance of Research Design," in *Rethinking Social Inquiry: Diverse Tools, Shared Standards*, ed. Henry E. Brady and David Collier (Lanham: Rowan and Littlefield, 2004), 190-92.

order to determine the way in which issues related to hydropower on the Mekong have been considered from a security perspective – whether explicit or implicit.³⁰⁴ Additionally, literature that provided a cultural and historical background was also reviewed in order to provide a deeper and more specific understanding of the social and political machinations present in the Mekong river basin.

Interviews

Interviewing in case studies for the purposes of triangulating data is a standard research method consistent with the mixed methods approach.³⁰⁵ Triangulating in this way enables the researcher to produce more objective and valid results and is considered an important component of a solid case study.³⁰⁶ The interviews conducted for this thesis are divided between expert interviews and villager interviews. Given the macro and micro perspectives of this thesis, the interviews were designed to shed light on both of these areas. The expert interviews tended to give a perspective on the macro (although some NGO interviews also related to the micro) and the villager interviews were specifically designed to give insight into the micro level – that is, the way that the construction and operation of a hydropower project specifically impacts on the lives of villagers in the Mekong River Basin.

Both expert interviews and villager interviews were carried out during fieldwork to the Southeast Asian region and in accordance with the University of Sydney's ethical guidelines. Expert interviews were carried out by interviewing experts within the field of inquiry in regards to their knowledge of the thesis's research topics and took place in Thailand, Vietnam, Lao PDR and Cambodia. Villager interviews were conducted in Lao PDR near the site of the Nam Theun 2 Dam (NT2) and were designed to bring much deeper perspectives on the social impacts of hydropower projects in the Mekong.

Expert Interviews

Expert interviews require specific skills and methodologies from the researcher. The methodology used for these interviews is what is referred to as a 'democratic'

³⁰⁴ Linguistic discourse analysis was not performed on this literature. This literature informs the thesis and its aims rather than discourse analysis being the aim of the thesis.

³⁰⁵ Yin, *Case Study Research*, 91-93; Eisenhardt, "Building Theories," 534.

³⁰⁶ Jonsen and Jehn, "Using Triangulation," 125.

process.³⁰⁷ This means that the interests and objectives of both the interviewer and the expert is taken into account.³⁰⁸ For this reason, the interviews were semi-structured.³⁰⁹ Yin refers to this as a 'focused interview' where "the interviews may still remain open-ended and assume a conversational manner, but you are more likely to be following a certain set of questions derived from the case study protocol"³¹⁰. This enables the researcher to test the case at hand, but also the ability to discover new and unexpected insights from a more flexible structure.

Potential interviewees were contacted according to the University of Sydney's ethical guidelines. Altogether, over 150 email requests were sent, which secured only around 20 significant responses. Many phone-calls were also made on arrival in the various locations, often resulting in a "managed approach" to calls, requesting questions to be emailed or the interviewer to call back at another time. When interviews were secured, these were carried out as a face-to-face interview in the interviewee's places of work so as to set the informants at ease. According to the semi-structured approach, a list of questions were drafted that married with the interviewees expertise. A list of the various interview questions that were asked of the expert interviewees can be found under Appendix 1 at the end of the thesis.

The semi-structured interview environment enabled the expert, or "informant"³¹¹, to both answer the set questions but also to lead the conversation onto topics that he or she believed was salient to the thesis or project. This process allowed the researcher to "probe emergent themes or to take advantage of special opportunities which may be present in a given situation"³¹². It also enabled the informant to share knowledge, shed light on unexpected topics and to display possible biases or agendas. The revelation of bias or specific agenda is an important aspect of the research and this knowledge helps the researcher when analysing the data to be aware of and discuss threats to validity.

³⁰⁷ Vaida Obelene, "Expert Versus Researcher: Ethical Considerations in the Process of Bargaining a Study," in *Interviewing experts*, ed. Alexander Bogner, Beate Littig, and Wolfgang Menz (Basingstoke: Palgrave Macmillan 2009), 184.

³⁰⁸ Obelene, "Expert versus Researcher," 199.

³⁰⁹ Kevin Dunn, "Interviewing," in *Qualitative Research Methods in Human Geography*, ed. Iain Hay (South Melbourne: Oxford University Press, 2000), 52.

³¹⁰ Yin, *Case Study Research*, 85.

³¹¹ Yin, *Case Study Research*, 84.

³¹² Eisenhardt, "Building Theories," 539.

Villager Interviews

The villager interviews took place along the Xe Bang Fai River and the Nakai Plateau in central Laos over a two week period. Interviewing villagers affected by this dam was a critical part of gaining insight at the micro level of the impacts to individuals and communities of hydropower projects. These interviews were designed to uncover the perspective of villagers who have been impacted by the dam in order to understand what changes have occurred and how these may relate to security.

The target area for interviews was around the Xe Beng Fai basin – the drainage area for the Xe Bang Fai River and the NT2 – as well as the area immediately surrounding the reservoir of the NT2. These two areas were specifically targeted because prior research had indicated that these were the most affected by the construction and operation of the NT2. Village headmen and village elders were interviewed through a translator exploring their experiences in regards to resource scarcity following the construction of the Nam Theun 2 Dam (NT2).

A note must be made here regarding my interpreter and guide, Somboun. My greatest concern regarding an interpreter was that they would interpret poorly by omitting important information regarding interviewees' insights into political matters. I had been warned by several NGOs that 'official' Government of Laos interpreters frequently did this and would refuse to interpret questions for villagers that they considered inappropriate. In order to get the most accurate view of how villagers' lives had been impacted by the NT2, I searched for an independent interpreter who would ask the questions that I posed and relay the answers as accurately as possible. I also wanted to engender trust between myself and the interviewees, and given the Government of Laos' poor human rights record, I did not believe that the way to achieve this was by using an official government interpreter.

Somboun was recommended to me by a local NGO leader in Bangkok. He had previously reliably interpreted for two separate NGO field research trips around the NT2 and elsewhere. His fee was US\$100 per day in addition to accommodation, living expenses and transportation. At the time he was an undergraduate student of the University of Laos studying environmental science. He had been born and raised in the Xe Bang Fai region and had extensive knowledge of the local area.

Somboun must be mentioned here because the potential for bias must be acknowledged. As a former resident of the Xe Bang Fai Basin, there is no doubt that his family had been impacted by the construction and operation of the NT2 – in fact he acknowledged this fact and related it to his decision to study environmental science. As a result, it is possible that he deliberately guided me to areas that were badly affected by the NT2 and that were not representative of the overall region. However, on the rare occasions where I ignored his advice on travel time or difficulty, I found that his insight was invariably correct and regretted my decision to override his advice. While we rode through the region, I was able to witness the widespread impact of the NT2 – be it through erosion of riverbanks or flooded forests – without the need for an interpreter.

The other major concern regarding Somboun was that he may interpret incorrectly and only give me answers that he either thought I was looking for, or given the possibility of his own agenda, bring a more negative light on the situation regarding the impacts of the NT2. To counter this I firstly ensured that he was paid well (US\$100 is a large sum of money in Laos with an average GDP per capita of \$US1645) and made it abundantly clear that my research was for a thesis that would only be read by a handful of people. I told him that there was no need to embellish issues, but to only ask the questions I ask, and to interpret as accurately as possible. Somboun agreed to these terms. Given the slightly unknown quantity of Somboun – in that he may represent a bias – and the absolutely known quantity of a government interpreter – in that they would definitely skew my results, I chose Somboun.³¹³

Returning to the villager interviews, due to the limited communication in these remote areas, contacting potential interviewees prior to arriving in the area was not possible. There is limited overland communication via telephone, and equally limited mobile phone connection. The same can be said for internet connection. As a result, phoning or emailing ahead is not an option. This meant that I was heavily reliant on my guide and interpreter, Somboun, for his local knowledge of the area. Each evening, we planned where we would go the following day over a detailed topographical map of the region. I told him the general area that I wished to go and

³¹³ An excellent discussion of the challenges of using an interpreter in case study fieldwork can be found in: Janet Bujra, "Lost in Translation? The Use of Interpreters in Fieldwork," in *Doing development research*, ed. Vandana Desai and Rob Potter (London: Sage Publications Inc., 2006).

he informed me about travel time, river crossings, difficult terrain etc. that might impact on our travels or cause me to modify my plans.

This meant that interviewees were usually recruited and interviewed on the same day. Elders and village headmen were targeted due to the likelihood that they would possess a longer oral history and greater knowledge of local conditions. Somboun and I would ride into a village and request to see the village headman. If he was available, I would introduce myself and Somboun, inform him of my study, and ask if he would be willing to be interviewed regarding the impacts of the NT2. If he was not willing, I thanked him for his time and moved to the next village. I found that this rarely occurred and that people in general were willing and often keen to share their experiences. If the headman was willing, I arranged a time that this could be carried out. Often this happened immediately. If the headman was not there, I would attempt to ascertain when he would return and then try to schedule to return at the same time. Often this was not possible as the following day Somboun and I may have moved onto a different area.

Recruitment was therefore by no means an exact science. I followed a set procedure for each recruitment attempt, informing the potential interviewee of my study and asking them if they would be willing to be interviewed. There are two important points to note here. Firstly, recruitment was essentially a random sample of headmen from villages in a targeted geographical area. The implications of this is that there were many headmen and villages throughout the region that were not included in the study. Given the time, financial and the logistical constraints of a lone, postgraduate researcher on an extremely limited research budget, this was unavoidable. Secondly, the fact that the targets were village headmen means that the potential for gender-bias exists within the study. To some degree this was ameliorated in interviews where the wife of the headman voluntarily contributed to the interview. At other times, when headmen were not available, male and female village elders volunteered to be interviewed and give their own perspectives. Even so, concerns about a gender bias within the study are warranted and further or follow up studies would need to take this into account.³¹⁴

³¹⁴ For more on feminist perspectives and the implications to this research, see: Sharlene Nagy Hesse-Biber, Patricia Leavy, and Michelle L. Yaiser, "Feminist Approaches to Research as a Process: Reconceptualising

Semi-structured interviews were used although opportunities for conversation were somewhat limited due to language constraints. I worked through a list of interview questions that can be found under Appendix 2 at the end of the thesis. The interview questions revolved around villagers' perceptions, or qualitative information, rather than trying to obtain quantitative information in regards to changes. Relocated villagers were asked to assess the ways in which their livelihoods, health and food security has changed (or remained unchanged) since being relocated. Downstream residents along the Xe Bang Fai River were asked the same questions in relation to the changes that have occurred since the commencement of hydropower operations. Both relocated villagers and downstream residents were interviewed so as to get a broader view of the impacts.

Document Analysis

The document analysis focused on documents and reports relevant to hydropower and resource scarcity.³¹⁵ Reports from non-government organisations, such as International Rivers, Oxfam and Greenpeace, were analysed to provide a human security perspective. Other civil society organisations, such as the Mekong River Commission, have produced a vast array of reports on hydrology and fisheries data which were analysed in detail and relevant documents from hydropower companies were examined where available.

Although publicly available government documents were analysed where possible as part of the document analysis, one of the most challenging issues for a researcher in the Mekong River Basin is the opaque nature of the governments in the region. Obtaining documentation from or getting an interview with government officials is difficult due to the authoritarian nature of the regimes and the suspicion that is often held towards foreigners. This was especially true in Lao PDR and not only applied to the government, but also to the Mekong River Commission and hydropower companies due to the controversy surrounding the construction of hydropower projects. The ability to gain access to documents from these sources was sporadic at best.

Epistemology, Methodology and Method," in *Feminist Perspectives on Social Research*, ed. Sharlene Nagy Hesse-Biber and Michelle L. Yaiser (New York: Oxford University Press, 2004), 11-15.

³¹⁵ Document here – as well as the media documents below – were analysed according to Bowen's (2009) research method as set out in: Glenn A. Bowen, "Document Analysis as a Qualitative Research Method," *Qualitative Research Journal* 9, no. 2 (2009).

Media Sources

Due to the difficulty in gaining access to government sources, media sources became a vital part of the research process. This is partly due to the fact that many of the main newspapers in the region are the voice of the government and therefore provide the official line on any given subject. Contrasting or conflicting views over an issue from newspapers from different nations can provide excellent insight into tensions between various governments. This is especially true for Vietnam and China; Vietnam and Lao PDR; and Cambodia and China over hydropower projects. In countries like Thailand where there exists a freer press, contentious issues such as dams are often allowed a higher profile and therefore relevant social issues that may not receive a voice in other countries are highlighted by the Thai media.

Additionally, media sources often provide information regarding new data or reports that are available relevant to local environmental changes. For a researcher not living in the region these are crucial links. Media also provides an awareness of current events – especially those to do with environmental changes and disasters – but also cultural, social, and religious. Obviously data collected from media sources needs to be treated carefully and checked for veracity, but as suggested above, media sources are much more than conduits of fact, providing a rich source of political, cultural, and social perspectives relevant to the thesis.

Conclusion

According to Yin, a good research design will pass four common tests: construct validity; internal validity; external validity; and reliability.³¹⁶ By carefully constructing the research design, outlining the construction of the case study, and triangulating the data, it is hoped that the thesis has sound construct validity. There are certainly risks to internal validity, and the conclusions made in regards to the consequences of hydropower construction must be well considered, tentative where necessary and allow for exogenous possibilities. Considering rival explanations will also be part of achieving internal validity. External validity is possible because this single case study has been carefully linked with pre-existing theory. As has been explained above, however, the main aim of the case study is not to be generalisable – and therefore ‘externally valid’ – but instead to give unique insight into what is occurring in the

³¹⁶ Yin, *Case Study Research*, 33-39. See also: Mitchell and Bernauer, "Empirical Research," 8.

Mekong river basin from the perspective of environmental security. This being said, it is nevertheless intended that the research contained within this thesis will be applicable to other river basins facing similar hydropower development, as well as providing insights into the way that a systemic approach to environmental security can inform the security literature more generally. Finally, by documenting the procedures of the case study, and providing evidence of the empirical data and theory used within the thesis, a researcher wishing to replicate the research process should be able to do this, thereby passing Yin's test of reliability.

By providing this clear methodology – in terms of both the overall thesis and the case study more specifically – it is intended that the research contained within this thesis will be carefully focused and directed towards the research problem and questions. The methodology above has achieved this by providing a clear research design, limiting the scope of the thesis, outlining the epistemological approach and overviewing the data collection methods. In addition to this it has provided more specific insight into the case study design, explaining and justifying the importance of the single, negative case. By considering in detail the theoretical and empirical components of the thesis, the links between the two can be tied more strongly together as it progresses. The next chapter will begin this process by considering the theoretical development of environmental security.

Chapter Three: The Problem with Environmental Security

The first step in creating a more satisfactory basis for managing the interrelationships between security and sustainable development is to broaden our vision.

Brundtland Report: *Our Common Future*.³¹⁷

Introduction

The literature review outlined the evolution of environmental security studies and its differentiated focus – from the nation state to a human security orientation. Building on this knowledge, this chapter acts as a bridge between the literature review and the empirical section of the thesis in order to help direct the empirical research more specifically. It achieves this in two ways. Firstly, it will summarise the lack of a theoretical core within Environmental Security Studies (ESS), outlining its divisions and the challenges that it faces in being understood as a discrete area of knowledge. This is related to the difficulty in defining exactly what environmental security is. Secondly, it will outline the as yet unrecognised yet discernible similarities running through the literature, what can be referred to as a common theme. Using this knowledge, it will then explain in more detail the premise behind the analytical framework of Systemic Environmental Security (SES). As part of this exploration, the various conceptualisations of environmental security will be represented in diagrammatical form in order to simplify these ideas and convey them visually. By developing this theoretical groundwork the following empirical chapters can explore more directly the elements most relevant to SES.

³¹⁷ Brundtland, "Our Common Future", Chapter 11: 37.

Environmental Security – an idea divided

The literature review chapter demonstrated that there is no central, theoretical core to the idea of environmental security. Clearly there has been a movement of sorts from a focus on state-based thinking towards a more human-oriented environmental security, but there are few similarities in the approach of early scholars with more modern conceptions of the idea. The problem then, is that locating where environmental security sits as a theoretical entity is virtually impossible.³¹⁸

Consequently, conceptualising, defining and deploying it as a guiding principle for policy development, risk avoidance, and securitisation in general, is highly problematic.³¹⁹

There are a variety of reasons for this lack of theoretical coherence. Firstly, the evolution of ESS from a national security focus to a human security orientation has not led to a well-developed field of interest with a large number of scholars participating in debates common across the field of enquiry. Secondly, the fact that both environment and security are highly contested terms leads the concept into immediate trouble. This leads to a great deal of ambiguity in regards to the definition of 'environmental security'. Of particular concern is the discipline of security studies which is itself a highly splintered field of enquiry. Finally, the necessarily cross-disciplinary nature of ESS means that a variety of perspectives from a variety of disciplines either combine or compete in their analysis of environmental security issues. This section will explore these three barriers to understanding environmental security in a more coherent way.

A Disjointed Evolution

Although ESS arose during the opening up phase of security studies in the lead up to and after the Cold War, it has not enjoyed the same success in infiltrating the broader security discourse as have other schools of thought such as constructivism, post-modernism and critical security. A simple review of the number of articles, books and indeed scholars involved in ESS compared with these other schools of

³¹⁸ Rita Floyd and Richard A. Matthew, "Environmental Security: An Introduction," in *Environmental Security: Approaches and Issues*, ed. Rita Floyd and Richard A. Matthew (New York: Routledge, 2013).

³¹⁹ The meaning of securitisation here follows Waever's claim that security is a "speech act". See: Ole Waever, "Securitization and Desecuritization," in *On Security*, ed. Ronnie D. Lipschutz (New York: Columbia University Press, 1995); Waever, "Security, the speech act."

thought gives a clear indication of this. In large part, this has resulted from environmental security's highly disjointed developmental process.

In its genesis, a variety of international security scholars demonstrated a keen interest in the links between environmental change and security but lacked the analytical tools to recognise and understand these links. International security, as a sub-branch of international relations, has for many years been dominated by the competing international relations' theories of realism and liberalism. Realism's main concerns revolve around aspects such as power balances and interstate conflict in an anarchic international environment where each actor seeks to maximise its own gains in what is believed to be a zero sum game.³²⁰ This state-centric focus on international conflict and outward looking national security left realism poorly placed to understand and conceptualise the potentially destabilising impacts of destructive environmental changes that frequently display both local and global elements simultaneously. Nevertheless, despite these shortcomings, concerns about the environment and its negative effects continue to resonate within the national security literature (see figure 2).³²¹

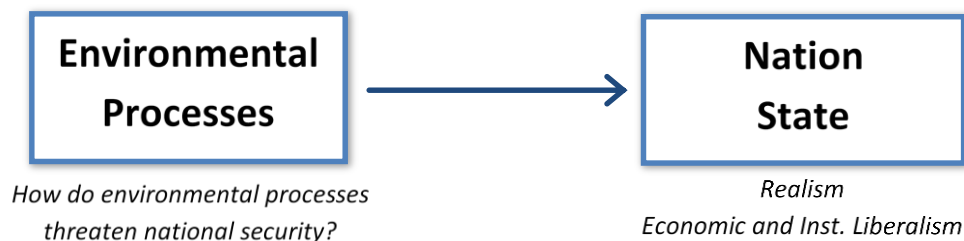


Figure 2: Traditional Security Conceptualisation of ESS

Alternatively, the other dominant traditional security field, liberalism, offers more cooperative ways of dealing with environmental problems, with its focus on relative rather than absolute gains. Trade, economic competition, the liberalisation of markets, liberal institutions and globalisation have been credited with maintaining – for the most part – a level of peace and prosperity in the second half of the 20th and

³²⁰ Some central texts espousing these points are: Mearsheimer, *The Tragedy of Great Power Politics*; Waltz, *Theory of International Politics*; Hans, *Politics Among Nations: The struggle for power and peace*.

³²¹ "Global Military Advisory Council on Climate Change (GMACCC)," *GMACCC*, 2014: <http://gmaccc.org/>; Laura Barron-Lopez, "Pentagon: Climate Change a National Security Threat," *The Hill*, 13 October, 2014: <http://thehill.com/policy/energy-environment/220575-pentagon-unveils-plan-to-fight-climate-change>.

beginning of the 21st century.³²² It is believed that the spread of democracy has also been an important driver in the spread of liberalism and peace.³²³ The potentially more cooperative international environment envisaged by liberal theorists, particularly liberal institutionalists, provides theoretically fertile grounds for understanding and solving environmental problems.³²⁴ For example, international institutions, such as the United Nations, the IMF and the World Bank, have demonstrated deep concern for the impacts of negative environmental changes on the security, economic prosperity and livelihoods of those most vulnerable to these changes.³²⁵

Although there is certainly a degree of concern regarding the effects of environmental change in liberal international relations thought, issues such as carbon pollution, habitat destruction, species extinction and the pollution of waterways are still rampant and continue at a rapid pace. This is in part because liberal thought and globalisation go hand in hand with modern capitalism and market economies.³²⁶ Growth driven economies require ever increasing consumption from expanding middle classes, fuelled by significant non-renewable resource inputs such as coal for energy, oil for transportation, as well as renewable resources such as forests for the production of goods, and water as an industrial throughput. In other words, although liberalism is on one hand concerned about the negative security consequences of environmental change, on the other hand, its fundamental underpinnings are in large part what has driven that change for the past century or more, and what continues to drive that change at a rapid pace.

For these reasons, the movement from traditional security to environmental security was always going to present difficulties. Dissatisfaction regarding the links between national security and the environment has been expressed since the early days of

³²² See for example: Friedman, *The Lexus and the Olive Tree*. Much of liberal thought in this respect is based on the ideas of Smith. See: Smith, *Wealth of Nations*.

³²³ Doyle, "Kant, Liberal Legacies, and Foreign Affairs."

³²⁴ Axelrod, *The Evolution of Cooperation*; Keohane, *After Hegemony*.

³²⁵ See for example: "United Nations Environment Programme," *UNEP*, 2014: <http://www.unep.org/>; "Environment," *The World Bank Group*, 2014: <http://www.worldbank.org/en/topic/environment>; "IMF and the Environment," *International Monetary Fund*, 2014: <http://www.imf.org/external/np/fad/environ/>.

³²⁶ Peter Newell, "Globalization and the Environment : Capitalism, Ecology and Power." (Hoboken: Wiley, 2013), <http://USYD.eblib.com.au/patron/FullRecord.aspx?p=1175994>; David Roberts, *Global Governance and Biopolitics: Regulating Human Security* (London: Zed Books Ltd., 2010), 164-65; Arthur H. Westing, *From Environmental to Comprehensive Security*, 1 ed. (Dordrecht: Springer, 2013), 114.

ESS. The most controversial issues have revolved around whether environmental security should sit within the remit of national security at all and whether violent conflict is an appropriate focal point. The problem is that there is very little sustained theoretical attention to these issues – at least from the national security perspective.³²⁷ The realist mindset continues to dominate and struggle with the inclusion of environmental security issues that traditionally sit outside the purview of national security and there is little, if any, engagement with the critical and human security literature of Barnett and Dalby.

Deudney in particular was a harsh critic of linking national security with environmental issues, arguing in the early 90s that the zero-sum, short-term and nationalistic mentality of the national security mindset was counter-productive to solving environmental problems.³²⁸ He was also critical of the environmental movement's foray into security, suggesting that "it seems doubtful that the environment can be wrapped in national flags without undercutting the 'whole earth' sensibility at the core of environmental awareness"³²⁹. He concludes:

Environmental degradation is not a threat to national security. Rather, environmentalism is a threat to 'national security' mindsets and institutions. For environmentalist to dress their programmes in the blood-soaked garments of the war system betrays their core values and creates confusion about the real task at hand.³³⁰

The work of Homer-Dixon moved the debate away from a primarily state-centric focus and towards an empirical exploration of the assumption that scarcities in renewable resources such as fish, forests, soil and fresh water would lead to violent conflict. The results of the case studies of the Environmental Change and Violent Conflict (ECAC) project demonstrated an absence of links between environmental scarcities and conflict between nations. Concerns regarding mass migration, environmental refugees, and the failure of states as a result of significant

³²⁷ Rita Floyd, "Analyst, Theory and Security: A new framework for understanding environmental security studies," in *Environmental Security: Approaches and Issues*, ed. Rita Floyd and Richard A. Matthew (New York: Routledge, 2013), 21.

³²⁸ Daniel Deudney, "Environment and Security: Muddled Thinking," *Bulletin of the Atomic Scientists* 47, no. 3 (1991); Daniel Deudney, "The Case Against Linking Environmental Degradation and National Security," *Millennium - Journal of International Studies* 19(1990): 466-68.

³²⁹ Deudney, "The Case Against," 468.

³³⁰ Deudney, "The Case Against," 475.

environmental changes remained however. For this reason, environmental scarcities and violent conflict have sustained their conceptual links and Homer-Dixon's framework has continued to find a place in public, political and academic discourse.³³¹

The difficulty with Homer-Dixon's framework is that it is easily appropriated by national security arguments.³³² Kaplan's 'Coming Anarchy' is the obvious example presented in the literature review, redirecting Homer-Dixon's empirical work towards Kaplan's own agenda, which led to a range of public concerns about competition over dwindling resources.³³³ The consequence of this, however, was that the focus on violent conflict had the effect of initially lending itself to national security and military concerns about environmental degradation, and subsequently giving birth to a range of critiques that splintered rather than solidified the idea of environmental security.

Two of these critiques demanded much greater specificity, albeit from totally different paradigms. Gleditsch questioned the veracity of the work of Homer-Dixon due to its lack of quantitative rigour, requiring instead more exacting research focused on the careful construction of quantitative models drawn from large data sets. Political ecology, on the other hand, demanded much greater qualitative specificity drawing on the temporal and spatial details of a particular setting in which environmental change occurs. Both of these critiques led to a degree of debate around the turn of the century, most significantly between Homer-Dixon and proponents of political ecology.³³⁴ An important discussion also arose between Gleiditsch and Homer-Dixon regarding the neo-Malthusian versus cornucopian debate, also known as the "shrinking pie or honey-pot" thesis.³³⁵ Far from moving ESS towards a more united view, these debates further splintered the idea with political ecology remaining

³³¹ For example: Thomas Bernauer, Tobias Böhmelt, and Vally Koubi, "Environmental Changes and Violent Conflict," *Environmental Research Letters* 7, no. 1 (2012); Oli Brown and Robert McLeman, "A Recurring Anarchy? The emergence of climate change as a threat to international peace and security," *Conflict, Security & Development* 9, no. 3 (October 2009).

³³² An example of the obvious links between the two can be found in: Thomas Homer-Dixon, "Scarcity and Conflict," *Forum for Applied Research and Public Policy* 15, no. 1 (Spring 2000).

³³³ Kaplan, "The Coming Anarchy."

³³⁴ "ECSP Report 9".

³³⁵ See: Fournier, "An Overview of the Ecoviolence Debate."; Schwartz, Deligiannis, and Homer-Dixon, "A Response to Gleditsch's Critique."

outside the security discourse and Gleiditsch remaining firmly entrenched in a quantitative mindset.

Around this same period, the work of Dalby and Barnett moved the discourse in a different direction, Dalby towards critical security and Barnett taking a human security turn. In questioning the assumptions within the environmental security discourse, Dalby introduced inclusive ecological principles rather than the popularly understood idea of nature and the environment being separated from humans and human practices.³³⁶ This understanding points to the idea that rather than nature or the environment being responsible for the harm that occurs due to negative environmental impacts, it is in fact humans who are responsible through the modern processes of globalisation and the “Anthropocene”.

Barnett’s human security approach takes a parallel position with Dalby in some regards, agreeing that much of the harm that occurs in the global South is due to consumption habits in the global North and the practices of globalisation and industrialisation. He answers Dalby’s question of who or what is being secured in environmental security by purposively emptying it of its old meanings regarding national security and violent conflict, and filling it with notions of human security (see figure 3).

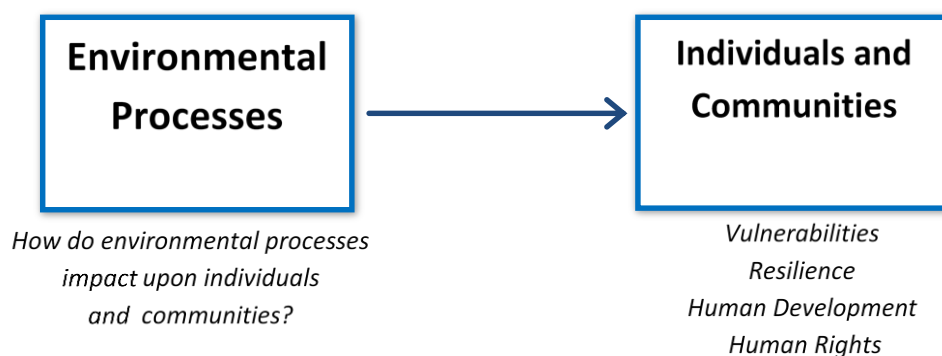


Figure 3: Human Security Conceptualisation of ESS

Individuals and groups are environmentally insecure if they are vulnerable and at risk of having their basic material needs diminished or removed as a result of the adverse effects of environmental change. According to this principle, there are hundreds of millions of people in the developing world who are environmentally

³³⁶ Dalby, *Environmental Security*, 132-33.

insecure due to the structural violence of poverty and inequity. Only through increasing, ensuring, and/or protecting their resilience can this risk and vulnerability be mitigated. Taking a long term perspective, this must be achieved by shifting the focus away from states as power maximisers, to states as providers and protectors of these basic needs.³³⁷

Quite clearly, the idea of environmental security is highly disjointed. As suggested in the introduction to this thesis, ESS seems to be little more than what occurs when scholars from a variety of academic fields discuss security issues from their own perspective as it relates to the environment. There is no central tenet and few theoretical debates that span the width of the field. One of the most serious challenges is that the literature on environmental security has not led to a critical mass, but rather a conglomeration of writing around a vague notion. The three scholars who have provided the most sustained attention on the subject – Homer-Dixon, Dalby and Barnett – are by no means united in their views: Homer-Dixon focused on violent conflict and complex causation; Dalby on the global and Anthropocene; and Barnett on the impact of environmental processes on communities and individuals. Nevertheless, each brings sorely needed depth and a scholarly approach which are reflected in their efforts to understand, conceptualise and theorise around this most complex of subjects.

What's in a Name? Environment and Security

Environmental security encounters serious challenges as a unitary concept not least because both 'environment' and 'security' are such ambiguous terms.³³⁸ It is unsurprising, therefore, that the term 'environmental security' tends to defy definition. Dalby's work in particular critically engages with the meaning of both environment and security, recognising that both are words with contested and controversial meanings. He questions how the state can remain the referent object of security, considering what it is that is being secured from an environmental security perspective. There is no need to rehash in detail Dalby's argument in reference to the environment. However, it is worth keeping in mind that Dalby considers the 'environment' to be a constructed term that refers to the "non-human material context

³³⁷ Barnett, *The Meaning of Environmental Security*, 136. A more detailed discussion can be found in: Shephard, "Thinking Critically About Food Security."

³³⁸ Sheehan, *International Security*, 105.

of human activities”³³⁹. The environment – as popularly conceived – regards nature as external, a thing to be managed and controlled. This idea of nature as external to humanity, rather than humans being a part of it, is a common misconception in public and political discourse.

As an alternative, both Barnett and Dalby suggest that using ecological principles, rather than traditional conceptions of an external ‘environment’, can provide greater insight into environmental security issues. This presents a serious challenge to environmental security and raises the question as to whether the term should be replaced by the more inclusive ‘ecological security’.³⁴⁰ Using ecology as a guiding principle would enable the simultaneous incorporation of mankind and ecological systems within the large system of the biosphere. In regards to this point, this thesis follows Barnett’s assessment that the term ‘ecological security’ lacks the ability to impact upon policy and discourse and, therefore, the word ‘environment’ is used as a more pragmatic term. Additionally, as will be demonstrated, understanding the environment as something separate from civilisational units such as the state or communities can provide a useful conceptual platform from which to work. Nevertheless, the ecological principles as introduced by Dalby can by no means be dismissed.

Although the idea of the environment is obviously an important part of this thesis, in essence, this is a security thesis, consequently privileging the security side of the debate. As Floyd observes, “anyone working in environmental security studies needs a firm grounding in the different theories of security, and to a lesser extent also in International Relations theory”³⁴¹. The literature review in Chapter One that followed the evolution of environmental security through its various iterations, tells the story of not only a divided notion of environmental security, but also a splintered idea of security in general. Security studies range from the traditional realist, liberal and strategic accounts to constructivist, post-structural and critical discourse, to peace research, feminist, and human security debates.³⁴² The fact that security studies of

³³⁹ Dalby, *Environmental Security*, 5.

³⁴⁰ See: Dennis Pirages, "Ecological Security: A Conceptual Framework," in *Environmental Security: Approaches and Issues*, ed. Rita Floyd and Richard A. Matthew (New York: Routledge, 2013).

³⁴¹ Floyd, "Whither Environmental Security Studies?," 285.

³⁴² Barry Buzan and Lene Hansen, *The Evolution of International Security Studies* (Cambridge: Cambridge University Press, 2009), 35-38.

the environment cannot find an epistemological home is at least in part a reflection on the multiple and varied perspectives of security across the global academic community.

There is no intention to go into the specific arguments between schools of thought within security studies here. It is important, however, to understand not only that the disparateness of environmental security is a product of the more general security discourse which is itself splintered, but to also understand how this plays out in more specific ways that impact on our understanding of the concept of environmental security. Of primary concern here is the argument about who or what is to be secured. Traditional accounts of security focus on the security of the state or the international community, whereas critical and human security approaches tend to focus on the individual. Much of the debate in security studies surrounds this dichotomous approach of *either* the individual *or* the state as that which is to be secured.³⁴³

In this sense, the concept of environmental security is an outworking of this bifurcated view of security. The argument over the referent of security in ESS – whether it be the individual or the state – is usually dialectical,³⁴⁴ but is hardly unique to ESS. What is unique is that this debate is occurring within a single branch of security studies – highlighting the splintered nature of the concept of environmental security. Even though this is the case, what is fascinating and perhaps peculiar to ESS is that it acts as a unifying sector of interest between the level of the state and the individual. Although the epistemological perspective of realism and human security studies are obviously leagues apart, both share the common interest of attempting to understand the way that environmental processes impact upon security. This suggests that the *either/or* dichotomy of security studies may not be the appropriate approach for environmental security studies.

Crossing Disciplines

The final characteristic that adds to the theoretical splintering of ESS is its cross disciplinary nature. Security studies sits under the general umbrella of the social

³⁴³ Buzan and Hansen, *The Evolution of International Security Studies*, 25.

³⁴⁴ Rita Floyd, "The Environmental Security Debate and its Significance for Climate Change," *The International Spectator* 43, no. 3 (2008): 57.

sciences, whereas ‘the environment’ is generally associated with the natural sciences. In addition to these we must also add migration studies which tends to be situated within human geography – but is itself often interdisciplinary (See figure 4).³⁴⁵ Furthermore, as the above section clearly demonstrates, even within disciplines or schools of thought there are strong debates regarding methodological and epistemological approaches and, as has been demonstrated in the case of security studies, what or who the referent of security should be. The fact that disciplines themselves are by no means homogenous only adds to the complexity of a cross disciplinary approach.

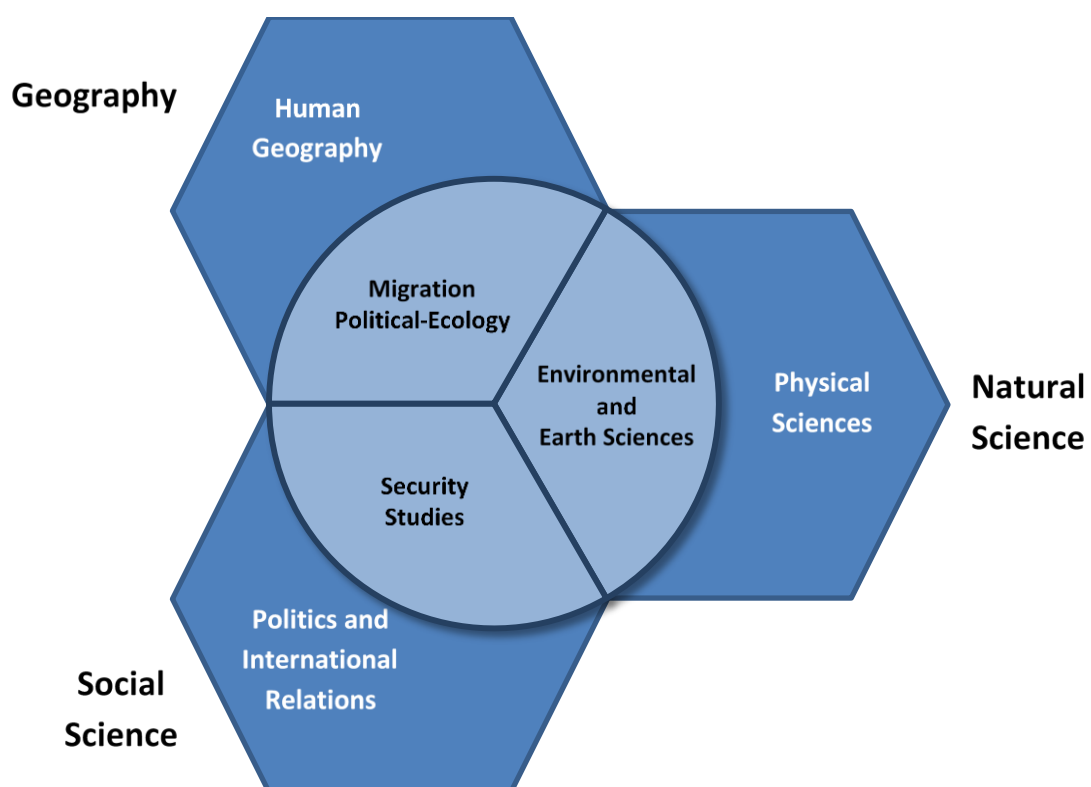


Figure 4: Cross Disciplinary Conceptualisation of ESS

Apart from the obvious fact that the title of this field of interest includes both the environment and security – two divergent academic fields – it is the range of empirical concerns and interests in the environmental security literature that require a cross-disciplinary mindset. Environmental issues such as soil degradation, fisheries destruction, deforestation, fresh water challenges, food security, climate change, ozone depletion and pollution, intersect with social and political dimensions including refugees and migrants, state instability, human vulnerability, population

³⁴⁵ Caroline B. Brettell and James F. Hollifield, *Migration Theory: Talking across the disciplines* (New York: Routledge, 2000).

growth, ethnic tensions, globalisation and conflict related to environmental scarcities. As has been suggested elsewhere, "(i)n view of the diversity of work it has been called on to perform, it is perhaps inevitable that the meaning of environmental security has remained diverse and often contested"³⁴⁶. This vast range of interests interact in complex and non-linear ways that do not lend themselves to simple explanations.

This presents a considerable challenge to any involved in the environmental security discourse. In fact, the complex issues tackled by ESS present a serious challenge to the knowledge siloes of tertiary scholarship more generally – including post-graduate research such as this thesis.³⁴⁷ Homer-Dixon describes this situation accurately: "(R)esearchers must acquire detailed knowledge of a daunting range of disciplines, from atmospheric science and agricultural hydrology to energy economics and international relations theory"³⁴⁸. This raises serious questions as to the level of knowledge required in any environmental security research: Should environmental security experts be trained in both the political and physical sciences, or can environmental security be grounded on just one side of the divide? Alternatively, should environmental security research always be collaborative – given its cross-disciplinary nature?

This further raises the question of whether environmental security itself can ever be considered to be a discipline as such. In their study of interdisciplinarity, Hulme and Toye suggest that there is a difference between *knowledge communities* and *disciplines*. In their opinion, knowledge communities are:

...a network of knowledge-based experts who share an interest in a subset of knowledge issues, and who accept common procedural protocols as criteria to judge the success of their knowledge creation activities. What is essential here is not that all members of a knowledge community know or communicate with each other, but that they have common intellectual interests and aims, and a shared understanding

³⁴⁶ Floyd and Matthew, "Environmental Security: An Introduction," 2.

³⁴⁷ David Hulme and John Toye, "The Case for Cross-disciplinary Social Science Research on Poverty, Inequality and Well-being," *The Journal of Development Studies* 42, no. 7 (2006): 1093; Sheldon Anderson et al., *International Studies: An Interdisciplinary Approach to Global Studies* (Boulder: Westview Press, 2008), 3.

³⁴⁸ Homer-Dixon, "On the Threshold," 84. See also: Thomas Homer-Dixon, *The Upside of Down: Catastrophe, Creativity, and the Renewal of Civilization* (Washington, D.C.: Island Press, 2008), 209.

and acceptance of the methods by which their sort of knowledge is successfully created.³⁴⁹

On the other hand, “disciplines arguably share not just aims, interests and methodological norms, but also a distinctive culture – made up of attitudes, aspirations and social values”³⁵⁰.

According to this definition and based on the evidence presented here, it is obvious that environmental security is by no means a discipline. The disparate nature of environmental security studies and the highly varied perspective of scholars on the subject leaves this area of research interest absent of its own distinctive culture and methodological norms. In fact it is difficult to see environmental security even as a knowledge community if “a shared understanding and acceptance of the methods by which...knowledge is successfully created” is required. On the other hand, for the most part, those involved in the environmental security discourse generally have similar intellectual interests and aims in that they are attempting to understand the way that environmental processes interact with security – in whatever form of security they consider to be superior.

An example of this cross-disciplinary challenge exists within the environmental refugee component of ESS. On one side are security minded scholars focused on violence and conflict – the maximalists – and on the other, geographers and migration experts focused on the specifics of the migration process – or the minimalists.³⁵¹ Minimalists, such as Black, tend towards the view that in the absence of a clearly identified causal mechanism between the environment and migration, it is safer to continue to discuss migration in terms of the push and pull factors mostly associated with social opportunity, political stability and economy –issues that generally fall within the remit of human geography. Maximalists, such as Myers, over-emphasise the links, undoubtedly mistaking correlation with causation at times. Although the maximalist agenda obviously falls within the remit of security studies, it

³⁴⁹ Hulme and Toye, "The case for cross-disciplinary research," 1094.

³⁵⁰ Hulme and Toye, "The case for cross-disciplinary research," 1095.

³⁵¹ Astri Suhrke, "Environmental Degradation and Population Flows," *Journal of International Affairs* 47, no. 2 (1994): 474-79.

has been criticised for its potential to view victims of environmental change as threats to the state, rather than people in need of support and protection.³⁵²

What these cross-disciplinary debates emphasise is that to understand the broader nature of the relationship between the environment and security, perspectives and methods of disciplines outside of the normal scope of international relations must be researched, understood and to a certain degree, applied. Failure to do so is likely to result in the ignorance of a large body of already well-established literature. If cross-disciplinary perspectives are ignored in order to avoid confusion and methodological difficulties, deliberately siloing environmental security within the arena of the social sciences, then the depth of knowledge and theory required to understand environmental issues in a security context is significantly weakened to the point of being irrelevant to and ignorant of the broader issues.

Why the Continued Effort?

It is abundantly clear that the idea of environmental security is a highly splintered notion. ESS face a range of complex challenges in conceptualising it as a holistic idea. If we are to take Matthew's advice, there is in fact no need to try to understand it as a coherent whole:

Like environmental justice and sustainable development, environmental security should not be regarded as a clear and distinct idea, a simple principle or norm, but rather as an ongoing, multi-perspectival discussion that brings environmental concerns into new areas of human value and activity.³⁵³

It has also been suggested that environmental security is "a polysemous category encompassing a wide range of analytical and normative meanings and positions"³⁵⁴. This is essentially a glamorous way of saying that environmental security is little more than a confused discourse with no central theoretical or methodological platform, incapable of bringing its own coherent perspective on the interplay between the environment and security. On this note, Gleditsch cynically suggests that "(I)ike

³⁵² Chris Abbott, "An Uncertain Future: Law Enforcement, National Security and Climate Change," in *Briefing Paper* (London: Oxford Research Group, January 2008). 4.

³⁵³ Richard Matthew, "Human Security and the Environment: The North American Perspective," in *Human Security and the Environment: International Comparisons*, ed. Edward A. Page and Michael Redclift (Cheltenham, UK: Edward Elgar, 2005), 217.

³⁵⁴ Floyd and Matthew, "Environmental Security: An Introduction," 1.

common security, structural violence or sustainable development, environmental security (makes) a good slogan...But political success does not make a slogan into a workable research tool"³⁵⁵. If this is indeed the case, then arguably the term should be abandoned. If it does not stand for anything, then why the persistence with it as a category?

Although Matthew and Gleditsch may have accurately captured the incongruity of environmental security, accepting this as the status quo is by no means necessary. The increasing environmental challenges that are arising as a result of a range of issues such as climate change, global population growth, globalisation, decreasing water tables, increasing pressure on food systems and the interruption of ecological processes and services from industry and infrastructure means that more than ever our understanding of the interaction between the environment and security needs to be deeper and clearer. In achieving this, it is crucial to understand the complex challenges faced by ESS in order to move the notion of environmental security forward.

Environmental Security – Common themes and interests

The understanding that environmental security is a highly fractured idea raises a number of questions. If environmental security is such a disparate notion, then what is it that holds it together as a rough idea? Furthermore, can it ever be more than just the sum of its parts, or can we move towards conceiving and conceptualising it in a more united fashion? These are serious questions that no doubt require a great deal of investigation and theorisation and it is not possible to go into enough depth and research to answer these comprehensively in this thesis. It is possible however, to posit a common approach within the environmental security literature and investigate how this approach impacts on our understanding of environmental security, and furthermore, consider how it can be used to bring some unity and clarity to the subject. This section therefore outlines this common theme, focusing primarily on the preeminent authors of environmental security: Homer-Dixon, Dalby and Barnett.

³⁵⁵ Gleditsch, "Armed Conflict and the Environment." Italics are Gleditsch's.

The Similarities in Environmental Security Research

In presenting the ‘story’ of environmental security as told in the literature review – and any number of books and articles for that matter – it is tempting to view



environmental security as a ‘progression’ from the national security literature (NS) to the human (HS) and critical ecology (CE) discourse via the environmental scarcities and violent conflict (ESVC)

Figure 5: Temporal Evolution of Environmental Security Studies

literature. Thinking of environmental security in this way obviously implies that one step has naturally led to another, building on the knowledge gained from previous iterations (see figure 5).

As has been demonstrated above, however, environmental security is essentially what results when scholars and policymakers from a variety of perspectives securitise and discuss the links between the environment and security. Yes, there has certainly been a form of temporal and theoretical progression: Clearly Homer-Dixon’s work built upon and investigated the earlier national security literature. His framework, however, stands apart from that literature, finding little evidence to support a realist perspective. The focus on environmental scarcities and violent conflict created its own micro-discourse that was by no means a natural outworking of the national security literature. In the same vein, the critical security analysis of Dalby and others does not ‘progress’ from the national security nor the environmental scarcities and violent conflict literature. The same can be said of the work of Barnett and others who bring a deeper human focus to environmental security. There is no doubt that the later literature provides a much greater depth of analysis – and this should not be downplayed – however, this is to some degree a privileged temporal position due to the literature that has come before it rather than a simple progression from one idea to the next.

By instead using a wide lens in our perspective of environmental security and viewing it as a connected discourse surrounding the interactions between the environment and security, rather than a historical progression from national security to human security, a different picture emerges. Initially, we find the obvious similarities between the various approaches to environmental security. Each has an interest in the environment as well as security. Furthermore, each is interested in the

interactions between environmental processes – in one form or another – and the security outcomes. The obvious problem, as identified in the section above, is that there is no agreement on the security perspective used or the environmental processes to be focused on (see figure 6). Nor is there agreement on the methodological approach deployed in order to research and understand these interactions.

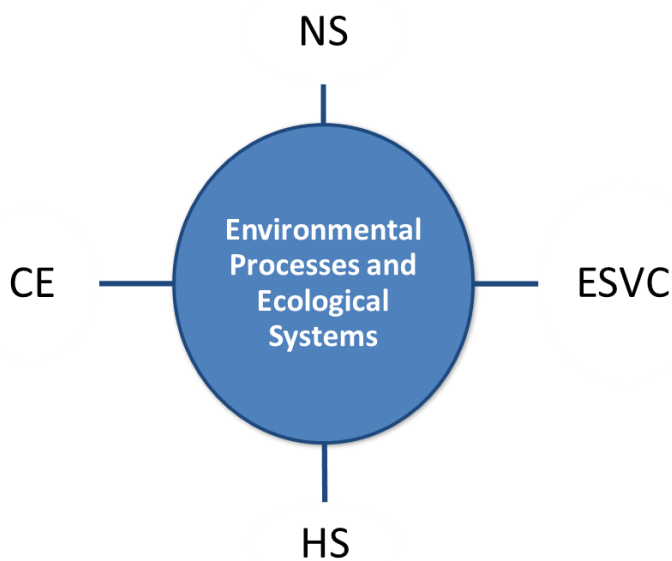


Figure 6: Current State of ESS

If we look more carefully however, there is another, less obvious similarity that may assist in ameliorating these differences to some degree. Each approach – from the national to the human security perspective – is not only exploring the relationship between environmental processes and security, they are attempting to do this in a systemic way. That is to say, they demonstrate an awareness that there are linkages between the impact of environmental processes and a range of security referents. This point must be expanded upon in order for us to understand it more clearly.

One of the most important questions asked of environmental security by Dalby is: “what exactly is being secured?”³⁵⁶ Is it the state, the international order, individuals

³⁵⁶ Dalby, "Environmental Security: Ecology or International Relations?," 11.

or the natural environment?³⁵⁷ This apparent competition between security referents within environmental security has driven a large part of the discourse but, on closer examination, it can be observed that despite there being a variety of approaches, each has similar aspirations. For example, the early literature that engaged with national security demonstrates a keen awareness that the security of the state is in some way linked with not only environmental processes, but also the security of millions of people in the developing world. State security is therefore linked ‘downwards’ with individuals, and ‘upwards’ with the international order.³⁵⁸ Ullman’s revised definition of security specifically incorporates individuals and institutions within the interests of the state, stepping outside the normal military mindset.³⁵⁹

The point is that the national security discourse related to environmental security does not only make links between environmental processes and national security but also attempts to come to terms with the fact that in order to understand these links, a recognition that the simultaneous incorporation of individuals, the environment and the state was required (see figure 7).

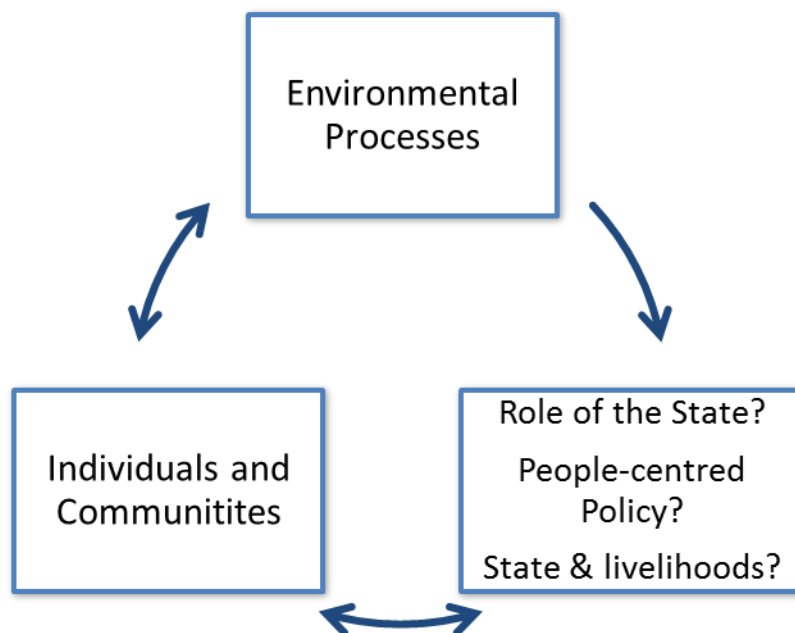


Figure 7: State Security, the environment and Human Security (State as Referent of Security)

³⁵⁷ Dalby, "Environmental Security: Ecology or International Relations?," 4.

³⁵⁸ Buzan, *People, States and Fear*, 26.

³⁵⁹ Ullman, "Redefining Security."

In a similar fashion, although the human security literature linked to environmental security is critical of the national (military) security discourse, it nevertheless recognises that the state has an important, albeit fundamentally different, role. Individuals and communities are obviously the most important referent of security in this analysis. However, as Barnett and Adger observe, “the state is a critical institution for the support of livelihoods”.³⁶⁰ The role of the state, therefore, is not so much the violent protection and subjugation of its citizens, but instead, a provider and enabler of the conditions that provide the basic needs of individuals and communities.³⁶¹ This, of course, means that policies created and actions taken by states must protect and enhance resilience, ensuring the environmental services that enable individuals and communities to meet these needs, particularly when it comes to subsistence livelihoods. Once again, the point here is that scholars of human security are stepping outside the bounds of their primary field of interest, not only towards understanding how the environment impacts upon human security, but also conceptualising the role of the state (see figure 8).

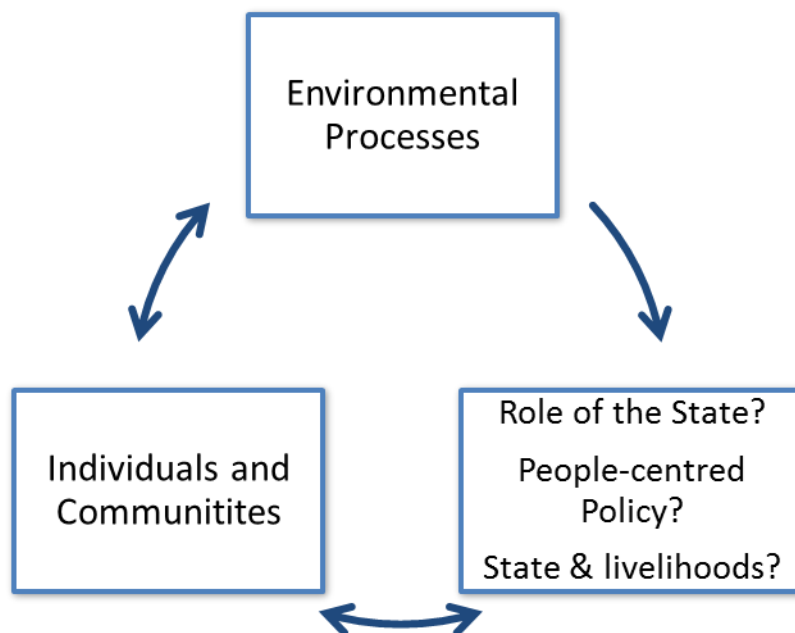


Figure 8: Human Security, the environment and the State (Individuals and Communities as Referent of Security)

³⁶⁰ Barnett and Adger, "Environmental Change, Human Security, and Violent Conflict."

³⁶¹ Barnett, *The Meaning of Environmental Security*, 128-29.

The environmental scarcities and violent conflict (ESVC) framework demonstrates explicit awareness and acknowledgement of the links between the state, individuals and the environment (see figure 9). Homer-Dixon focused on scarcities of renewable resources in regards to the environment, and investigated the ways that these scarcities might lead to violent conflict impacting on states (simple scarcity conflicts), individuals and communities (group identity conflicts), and economies and institutions (deprivation conflicts).³⁶²

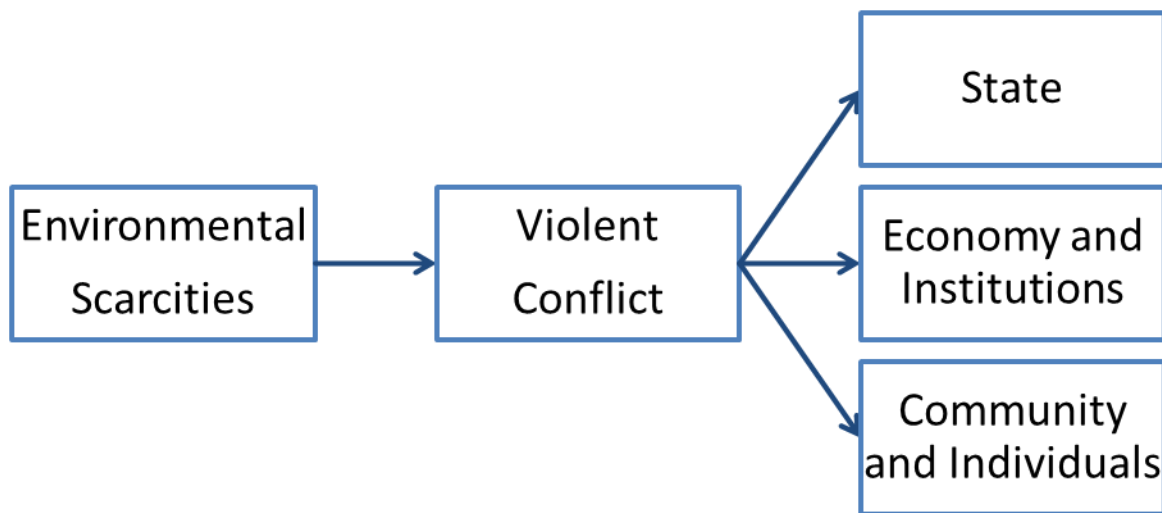


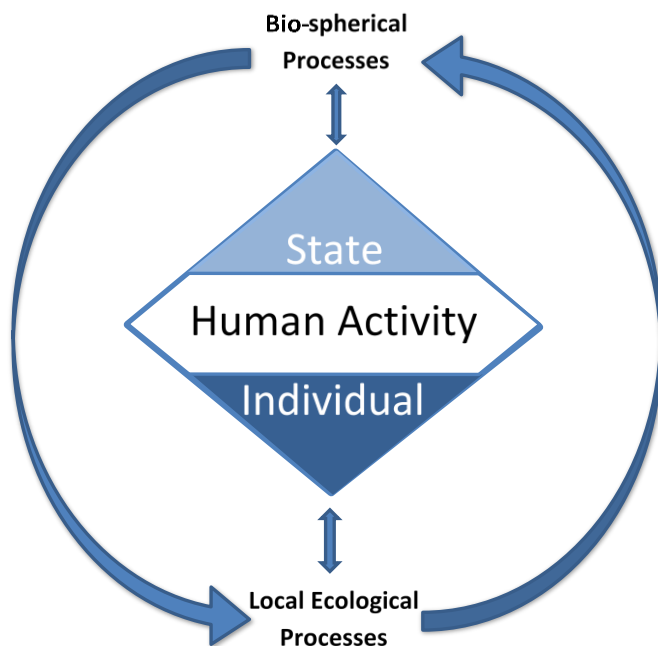
Figure 9: ESVC and ESS

Rather than viewing people as individuals, as in the human security literature, the ESVC literature tends to aggregate more, and there is a clear demographic tilt that at times views people in their millions rather than as individuals and part of communities. In a point of difference to both the state and human security discourse, the ESVC literature is not stepping outside of its methodological or paradigmatic boundaries, given that Homer-Dixon outlined his agenda in *On the Threshold*.³⁶³ Although on one fringe of the discourse sits political ecology and on the other Gleditsch and quantitative studies, the majority of the research is fairly neutral in its security perspective, following a semi-positivist approach to research, focusing on complex causation. Whatever the case, there is no doubt that the work of those involved in the ESVC discourse, demonstrates a desire to understand the way that environmental processes impact upon individuals and not just states.

³⁶² Homer-Dixon, "Environmental Scarcities."

³⁶³ Homer-Dixon, "On the Threshold."

Returning then to the critical security discourse, Dalby's theorisation around the idea of Empire gives an indication as to his views. His discussion of 'ecosystem people' – living subsistence lives at the periphery – and 'biosphere people' – those at the core drawing resources from the periphery to maintain and uphold their wealthier existence – demonstrates a more nuanced understanding that transcends the usual state versus human security dichotomy.³⁶⁴ The consumption habits of the wealthier



core have an impact on the security of those at the periphery through the destructive environmental changes wrought by the globalised economy. The role of the state is subsumed somewhat by the international or global in this scenario. Nevertheless Dalby sees the state as important in a positive sense when it enhances the human security of its population.³⁶⁵

Figure 10: Critical Ecology - human activity and ecological processes

State-based thinking, on the other hand, hinders our conceptualisation of environmental problems that pay no heed to national boundaries.³⁶⁶ Although Dalby's work is considerably different to that of other environmental security scholars, it demonstrates the same interest in the relationship between the state, individuals and environmental processes in a security context (see figure 10).

What we observe, therefore, is that each of the principal approaches to environmental security have similar aims in that they are trying to understand and conceptualise the way that the state, individuals and the environment interact in a security context. Some are more obviously explicit in their attempts whilst others are

³⁶⁴ Simon Dalby, *Security and Environmental Change* (Cambridge: Polity, 2009), 134.

³⁶⁵ Dalby, *Security and Environmental Change*, 157.

³⁶⁶ Dalby, *Security and Environmental Change*, 156.

more implicit, but each is at least attempting to make sense of the way that security is impacted in ways that do not fit in with pre-established methodological and epistemological mindsets. Instead, they are stepping outside of the usual bounds of security in trying to understand the way that a range of security referents are affected rather than just one. In particular, they are attempting to understand the links between the national and the human security elements of environmental challenges.

Environmental Security – a systemic approach

The analysis above outlines both the disparate nature of ESS, but also the similar knowledge aspirations of many of those involved in the discourse. It indicates that although environmental security is a splintered idea, it nevertheless contains elements of similarity across the field of investigation. It further indicates that the *either/or* approach of focusing on *either* state security *or* human security is an inappropriate platform from which to understand environmental security. From this perspective, the important question of “what is being secured in environmental security?” can be answered – but not within the normal bounds of expectation. Rather than settle on one referent object over the other – for example, state security as more important than human security – the answer appears to be that **it is not *either/or* but both**. Focusing only on states as the referent object of security is inappropriate in an environmental security context. Individuals and communities are the most vulnerable to environmental perturbations but tend to be invisible in national security analyses. On the other side of the equation, focusing only on the security of individuals and communities to the exclusion of states, is clearly an unrealistic goal in a world that continues to be dominated by state-based politics and the Westphalian order. States clearly remain an important part of the security equation, even if the nationalistic, border mentality of state-based thinking is inappropriate in solving complex ecological problems.³⁶⁷

Which brings us to the idea of Systemic Environmental Security in which the focus is on the system rather than each of the referent objects. The context of that system is both the international political order of states as well as the global and biospherical system of ecology that underpins it. We are therefore not only asking whether the security of the state is at risk: state security is important but not the end of the

³⁶⁷ For a broader discussion see: Eric K. Stern, "Bringing the Environment In: The Case for Comprehensive Security," *Cooperation and Conflict* 30, no. 3 (1995).

investigation. We are not solely asking if human security is being impacted: it is vital but not the only piece of the puzzle. We are not only asking if the viability of ecosystem services and environmental processes are being impacted by or are impacting upon individuals or states: this is obviously an important consideration, but once again, not the primary question. We are investigating how each impacts on the other in a systemic way. In something of an anathema to traditional academic research, Systemic Environmental Security posits that important knowledge is to be gained not by narrowing the focus of the research, but by widening our perspective in order to incorporate the system (individuals, states and the environment) as a whole (see figure 11). In this respect we are borrowing somewhat from critical ecology's conceptualisation of environmental security.

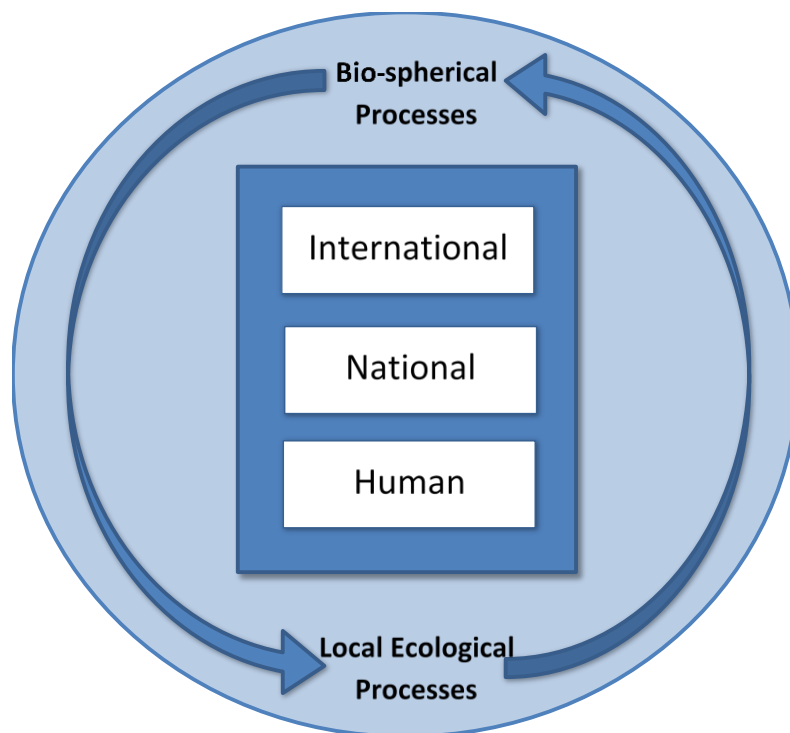


Figure 11: Systemic Environmental Security - Linking Ecological and Civilisational Units

This is, of course, not the first time that a collective or systemic approach to security has been forwarded.³⁶⁸ Of particular note in this respect is Buzan who, in a similar vein to Dalby's analysis of environmental security, questioned the referent object of

³⁶⁸ See for example: Westing, *From Environmental to Comprehensive Security*; Evelyn Goh, "China in the Mekong River Basin: The Regional Implications of Resource Development on the Lancang Jiang," in *Working Paper No. 69* (Singapore: Institute of Defence and Strategic Studies, July 2004); Stern, "Bringing the Environment In," 227.

security in regards to national security.³⁶⁹ Instead of the regular dichotomous approach to security referents, Buzan observes that “since the security of any one referent object or level cannot be achieved in isolation from the others, the security of each becomes, in part, a condition for the security of all”³⁷⁰. He goes on to conclude:

Some sense can be made of individual, national and international security, and of military, political, societal, economic and environmental security, as ideas in their own right. But a full understanding of each can only be gained if it is related to the others. Attempts to treat security as if it was confined to any single level or any single sector invites serious distortions of understanding.³⁷¹

This “integrated view of security”³⁷² has a similar perspective to Systemic Environmental Security. But whereas Buzan’s integrated security incorporates virtually all elements of security, Systemic Environmental Security is not so bold. From the literature, it is clear that the main elements of interest are states, individuals/communities and environmental processes. This is more than enough for this investigation.

In essence, therefore, Systemic Environmental Security does not ask “what is being secured?” It instead asks: What is the security relationship between the state, the individual and environmental processes? A visual indication of the context of this is given in Figure 10. Other than critical ecology, this differs greatly from previous conceptions of environmental security.³⁷³ At the civilisational (political and social) level, there are links between international, national and human security. From a systemic environmental security perspective, however, we can see that these civilisational activities occur in an environmental/ecological context. Ecology teaches us that these environmental processes, from the global/biospherical to the local, have strong interconnections and it is artificial and unhelpful to separate them.

³⁶⁹ Buzan, *People, States and Fear*, 15.

³⁷⁰ Buzan, *People, States and Fear*, 26. See also: Buzan and Hansen, *The Evolution of International Security Studies*, 25.

³⁷¹ Buzan, *People, States and Fear*, 363.

³⁷² Buzan, *People, States and Fear*, 378.

³⁷³ See for example figures one and two.

This being the case, although figure 11 is useful in visually conveying the context of Systemic Environmental Security, it struggles to express the relationships between the various components of the system. As it appears, the environment – or ecological processes – form the backdrop for the civilisational level.³⁷⁴ However, if we take Figure 11 and invert it, what we find is that environmental processes do not form the backdrop for human activities, but instead are foundational to them (see figure 12).

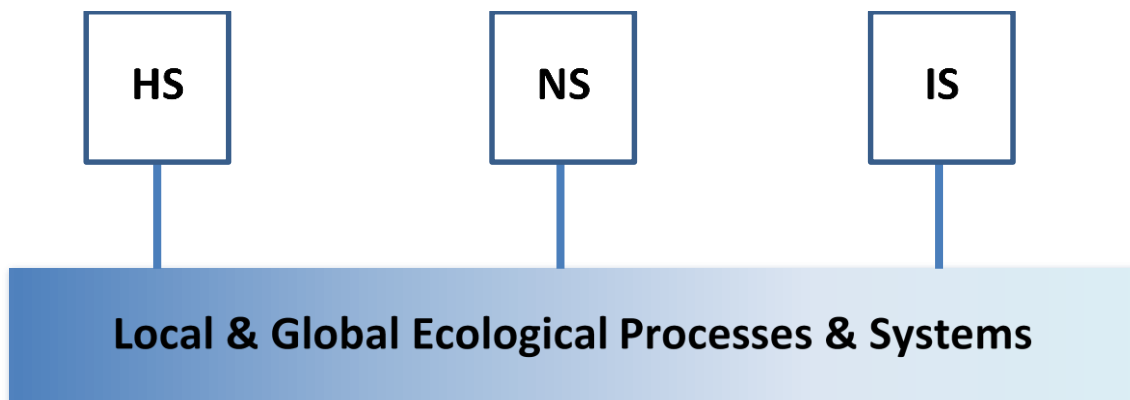


Figure 12: Systemic Environmental Security – Links security and the environment

What has hindered this understanding is that the bulk of security studies discourse has occurred in the twentieth and twenty-first centuries, during a period of hyper-industrialisation and an explosion in technological knowledge. This has occurred at least in part because the international system has its foundations in the Westphalian order of non-interference and respect for sovereign boundaries – an idea that has infiltrated deeply into international politics. Security studies has therefore also evolved during a period of mass urbanisation which has enabled security theorists, the majority of whom are based in Western universities, to theorise in almost total ignorance of the environmental context of human activities. This is what Dalby means when he describes ‘the environment’ as a colonial construction or “one that operates on the urban assumptions of an external nature whose resources are to be managed, rather than a context, place, or home that is to be lived in”.³⁷⁵

The fact that the importance of ecological processes and systems to the overall security make-up needs to be so painstakingly laid out gives a good indication of

³⁷⁴ Dalby, "Environmental Security: Ecology or International Relations?," 5.

³⁷⁵ Dalby, *Environmental Security*, 99. Dalby highlights the genesis of environment from ‘environ’, usually associated with that which surrounds (usually a town). See also page 126.

how far removed the bulk of traditional security studies has become from the world in which it operates. This does not imply that the nature of the relationship between states is unimportant, nor does it follow that national and global economic processes are irrelevant. Instead, Systemic Environmental Security posits that to ignore the role of environmental processes, and to fail to recognise how these are intricately connected to each other and to human activities in general, is to only get a part of the security picture. This is the challenge for traditional security studies. The same, of course, can be said for human security, but human security – with its roots in the Brundtland Report, already has strong connections with environmental principles.³⁷⁶ The key for human security – from a Systemic Environmental Security perspective – is to understand the role of the state and its part in the system. To advocate for human security issues without the requisite recognition that states play a crucial part in enhancing, encouraging or hindering it, would appear to be a serious flaw. The challenge for human security scholars is therefore to find ways of engaging states in a discourse that leads towards policies and actions that enhance and protect human security.

Returning to the important question of the referent of security, Systemic Environmental Security outlines the linkages between the state and the individual through the environment (see figure 13). It does not favour one referent over the other, however, given the evidence presented in the literature review and this chapter, it suggests that the traditional security discourse has the furthest to travel in terms of understanding – and perhaps accepting – these linkages. Systemic Environmental Security therefore investigates how the various parts of the system impact upon each other to enhance or degrade security and what actions and/or policies are appropriate for enhancing security and circumventing insecurity. This avoids the usual dichotomies of security and forwards an approach that, at least to some degree, ameliorates the differences between the various thought centres of ESS. It also perhaps presents an opportunity for these various approaches to understand and work with each other in a more productive fashion.

³⁷⁶ Brundtland, "Our Common Future".



Figure 13: Systemic Environmental Security - links between state and human security

From Theory to Empirical Exploration

The aim of this chapter has been to take the literature on environmental security, analyse it, and look for a potential way of understanding the disparate elements in a more united way. The analytical framework of Systemic Environmental Security suggests that all the elements of civilisation are simultaneously important in the security makeup, and this combines with a recognition that the ecological processes and systems that support it are connected in complex ways. This is, therefore, a deliberate attempt to progress the discourse, that is to say, it is an attempt to take certain elements of the literature and form them into an analytical framework that may assist in a clearer conceptualisation of environmental security. However, at this stage, it is underdeveloped and only theoretical in its outlook. For this reason, the thesis now turns to an empirical investigation into how a Systemic Environmental Security approach may shed light on the interaction between security and the environment in a specific context. The following chapters provide an opportunity to explore the idea of Systemic Environmental Security and how it relates to hydropower development in the Mekong River Basin.

Chapter Four: The Upper Basin – The Dominance of Traditional Perspectives

As regional economic relations deepen, it will become increasingly clear...that serious environmental and human security problems in one country can jeopardise the economic growth of the whole region.

Evelyn Goh: *Developing the Mekong*.³⁷⁷

Introduction

Chapters three and four constitute the case study chapters of this thesis. This chapter will take a macro approach, looking more specifically at the upper part of the Mekong River, in particular the Lancang Cascade and its impacts on the system as a whole. The following chapter will focus on a single dam, taking a much narrower, more focused approach in order to shed light on the micro impacts of dam construction in the Mekong River Basin. Both chapters will begin by outlining and analysing the biophysical and ecological effects of hydropower construction through a review of the scientific literature on the subject. Following this, the security discourse relevant to these issues will be considered in detail in an attempt to understand the ways in which these environmental security challenges are perceived or overlooked by the security community.

The chapter sets out to investigate how the either/or approach to environmental security impacts on perspectives in a given context – in this case the Mekong River Basin. In this chapter, the macro examination lends itself to the traditional or national security discourse. These perspectives tend to focus on national security and national economies, but absent from most of the discourse is any reference to human security and development. The security referent under consideration in this chapter is therefore the nation state.

³⁷⁷ Goh, "Developing the Mekong."

Section One: The Lancang Cascade and its impacts on the biophysical processes of the Mekong River Basin

The Mekong River Basin

Before moving on to the specifics of the case study we must firstly set the overall context by introducing the Mekong River Basin (MRB). The Mekong River is the largest river in south-east Asia flowing from its Chinese source in the eastern part of Qinghai Province, dropping greatly in elevation from around 5,000 metres above sea-level until it flows into the south of the South China Sea. The river's total length is approximately 4,900 kilometres,³⁷⁸ flowing firstly through Qinghai and Yunnan Provinces in China – where it is known as the Lancang Jiang – then through Myanmar, Laos, Thailand and Cambodia until it finally meets the ocean after flowing through the massive Mekong Delta in the southern regions of Vietnam. From its source to the ocean, the river travels through at least seven biomes (distinct, naturally occurring ecosystems) including alpine meadows and tropical and monsoonal forests.³⁷⁹ Myanmar contributes very little of the water flow to the Mekong (2%), has no planned projects for the river, and its considerable land mass only skirts the edges of the river for a very small distance. For this reason, and due to its seeming lack of interest in Mekong issues generally, it will not be included as part of the analysis.

The Mekong Basin can be subdivided into the upper – China's Yunnan and Qinghai Provinces – and lower basin and, although the Mekong is popularly associated with the southern reaches such as the Delta region, nearly half of its length is in the Chinese, upper section of the basin. It is estimated that the MRB as a whole is home to between 58 - 73 million people and ninety five different ethnic groups,³⁸⁰ covering an area of approximately 795,000 square kilometres.³⁸¹ The majority of those living in the MRB live subsistence lifestyles that rely heavily on the natural resources of the

³⁷⁸ M. Kumm et al., "Basin-wide Sediment Trapping Efficiency of Emerging Reservoirs Along the Mekong," *Geomorphology* 119, no. 3–4 (2010): 182.

³⁷⁹ Jinpeng Li et al., "Effects of Cascade Hydropower Dams on the Structure and Distribution of Riparian and Upland Vegetation Along the Middle-lower Lancang-Mekong River," *Forest Ecology and Management* 284(2012): 253.

³⁸⁰ "People of the Greater Mekong," *WWF Global*, 2014:

http://wwf.panda.org/what_we_do/where_we_work/greatermekong/discovering_the_greater_mekong/people_of_the_greater_mekong/.

³⁸¹ "Overview of the Hydrology of the Mekong Basin," (Vientiane: Mekong River Commission, November 2005). 1. Eastham et al., "Mekong Assessment".

basin, particularly agriculture and fishing, for both subsistence and employment.³⁸² Although estimates vary, the Mekong River Commission (MRC) predicts that the population of the lower basin alone will increase to over 100 million by 2025 which will undoubtedly increase the pressure on the renewable resources of the region.³⁸³

The Mekong's considerable annual flow of 470 km³ is split between distinct wet and dry seasons with 70 to 80 per cent of the annual discharge occurring between June and November.³⁸⁴ This means that the ecosystems of the MRB, including the abundant fisheries of the river, have evolved around an annual flood pulse; just as those who live within the basin have adapted their livelihoods and subsistence to this annual pulse over previous millennia. Of particular significance in regards to flooding is the annual reversal of the flow of the Mekong into the Tonle Sap Lake (Tonle Sap). Each year, between June and November, the immense floodwaters of the Mekong backup at the narrow neck of the river to the south of Phnom Penh in Cambodia, close to the border with Vietnam. This creates a remarkable natural phenomenon that reverses the river's flow, pushing water in-land through the hundred kilometre long Tonle Sap River tributary, transforming the surrounding landscape. 10 to 20 per cent of the Mekong's annual flow inundates the Tonle Sap, which grows from around 2,500 km² to 10,000-15,000 km², increasing the lake's average depth from 0.5 to 6-9m.³⁸⁵ The regularity of this flood pulse cycle is crucial to the survival, growth and distribution of fisheries, as the timing of the flood triggers spawning and migration behaviour and the unique ecosystems of the Tonle Sap provide important fish habitats.³⁸⁶

³⁸² "Climate Change and Rural Communities in the Greater Mekong Subregion: A Framework for Assessing Vulnerability and Adaptation Options," (Mandaluyong City, Philippines: Asian Development Bank - Greater Mekong Subregion, May 2014). Marwaan Macan-Markar, "Environment: Blame on Chinese Dams Rise as Mekong River Dries Up," *IPS-Inter Press Service*, Mar 17, 2010:

<http://www.ipsnews.net/2010/03/environment-blame-on-chinese-dams-rise-as-mekong-river-dries-up/>.

³⁸³ "Fisheries," *Mekong River Commission*, 2014: <http://www.mrcmekong.org/topics/fisheries/>. For a more detailed discussion on population growth in the Mekong river basin see also: Eastham et al., "Mekong Assessment", 11-16.

³⁸⁴ X. X. Lu et al., "Observed Changes in the Water Flow at Chiang Saen in the Lower Mekong: Impacts of Chinese dams?," *Quaternary International* 336(2014): 146.

³⁸⁵ Dirk Lamberts, "Little Impact, Much Damage: The consequences of mekong river flow alterations for the Tonle Sap ecosystem," in *Modern Myths of the Mekong: A critical review of water and development concepts, principles and policies*, ed. Matti Kummu, Marko Keskinen, and Olli Varis (Helsinki: Helsinki University of Technology, 2008), 4; Barry Wain, "Depleted Mekong River Draws Concern," *The Wall Street Journal* September 1, 2004.

³⁸⁶ Lamberts, "Little Impact, Much Damage," 11.

The annual flood pulse that occurs on a basin-wide level is also inextricably linked to the life cycles of the majority of Mekong fish species throughout the entirety of the basin.³⁸⁷ This flood pulse is therefore absolutely essential for the subsistence, livelihoods, and economic productivity of the MRB given that arguably, the most valuable resource in the MRB is its fisheries. The lower Mekong Basin is the most productive inland fishery in the world – producing between 2-3 million tonnes of fish per annum with a value of US\$2-3 billion at first sale and a retail value of nearly US\$8 billion.³⁸⁸ As the majority of fish collected from the MRB is also consumed there, this valuation is indicative only of the economic cost of replacing this vital protein source if depleted or stressed.³⁸⁹ Fish is essential for livelihoods and health, particularly in the lower basin, with annual average fish consumption at 56.6 kg per person.³⁹⁰ Fish and fisheries' products contribute between 47 – 80 percent of total animal protein consumption in the lower basin,³⁹¹ in addition to providing a vital supply of micronutrients.³⁹² The Tonle Sap alone provides livelihoods for at least one million people.³⁹³

Although there are a range of other renewable resources that play an important part in the livelihoods and economy of the MRB, the one other vitally important resource in the Mekong is silt or sediment. The Delta, in the southernmost part of Vietnam, has been built up over millennia by the slow but steady deposit of fluvial sediment that flows into the mainstream from the Mekong's many tributaries, travelling from as far away as the Tibetan plateau. Research indicates that around fifty per cent of the annual total sediment load in the Delta – estimated at between 150 and 170

³⁸⁷ Eric Baran, Teemu Jantunen, and Chong Chiew Kieok, "Values of Inland Fisheries in the Mekong River Basin," (Phnom Penh: WorldFish Centre, 2007), 7.

³⁸⁸ "What Do M.R.C. Studies Tell Us About the Implications of Mekong Mainstream Dams," in *Mekong Brief No. 9* (Sydney: Australian Mekong Resource Centre, November 2008); Patrick J. Dugan et al., "Fish Migration, Dams, and Loss of Ecosystem Services in the Mekong Basin," *AMBIO* 39(2010): 345.

³⁸⁹ Baran, Jantunen, and Kieok, "Value of Inland Fisheries", 18.

³⁹⁰ Baran, Jantunen, and Kieok, "Value of Inland Fisheries", 11.

³⁹¹ K. G. Hortle, "Consumption and the Yield of Fish and Other Aquatic Animals from the Lower Mekong Basin," in *MRC Technical Paper No. 16* (Vientiane: Mekong River Commission, 2007), 57. It is worth noting that other estimates range between 80-95%. See: Aviva Imhof, "The Mekong: Diverse, Magnificent, Threatened," *World Rivers Review* 22, no. 2 (June 2007). 1 and "Luangprabang Fisheries Survey," ed. Jens Grue Sjorslev (Vientiane: MRC Fisheries Program: Assessment of Mekong Fisheries Component (MRCFP) and Living Aquatic Resources Research Center (LARReC), 2000). 3.

³⁹² Stuart Orr et al., "Dams on the Mekong River: Lost Fish Protein and the Implications for Land and Water Resources," *Global Environmental Change* 22, no. 4 (2012): 928-29.

³⁹³ Lamberts, "Little Impact, Much Damage," 9.

megatons per year – originates from the upper, Chinese section of the MRB.³⁹⁴ This sediment not only has a barrier effect, in that it both builds up the Delta over time – holding back the ocean as well as combating sea-level rise – but it is also a natural source of fertiliser. This is one of the major reasons why the Mekong Delta is one of the most fertile deltas in Asia and is often referred to as the rice bowl of Southeast Asia.³⁹⁵ The farmers of the Delta produce over twenty million tonnes of rice per year, fifty-four per cent of Vietnam's total, exporting over seven million of this, worth approximately US\$3.5 billion³⁹⁶. This contributes to making Vietnam the second largest exporter of rice in the world, a significant player in the international grain market and an important contributor to global food security.³⁹⁷

Given the size of the basin, there are obviously other important environmental factors that contribute to the security of those who live there. For the purposes of this thesis, however, the above introduction will suffice to set the context for the case studies in this chapter and the next. More specifically relevant and detailed information will be provided as these chapters progress. The next section will hone in on the upper segment of the MRB, focusing on hydropower projects and their impact on the basin as a whole.

The Deleterious Effects of Dams

Background of the Lancang Cascade

Hydropower construction in the upper Mekong, or Lancang Jiang, occurs in the context of China's immense thirst for energy. The past two decades of breakneck economic and industrial growth combined with the largest rural to urban movement in known history has created scores of mega-cities and industrial complexes, all requiring vast amounts of energy.³⁹⁸ China has historically derived the majority of its energy from coal, but due in part to the health hazards that have resulted from

³⁹⁴ K. D. Fu, D. M. He, and X. X. Lu, "Sedimentation in the Manwan Reservoir in the Upper Mekong and its Downstream Impacts," *Quaternary International* 186, no. 1 (2008): 92; Matti Kummu and Olli Varis, "Sediment-related Impacts Due to Upstream Reservoir Trapping, the Lower Mekong River," *Geomorphology* 85, no. 3–4 (2007): 279.

³⁹⁵ Richard Cronin and Timothy Hamlin, "Mekong Tipping Point: Hydropower Dams, Human Security and Regional Stability," (Washington: The Henry L Stimson Centre, 2010).

³⁹⁶ Tuyet L. Cosslett and Patrick D. Cosslett, *Water Resources and Food Security in the Vietnam Mekong Delta*, Natural Resource Management and Policy (New York: Springer International Publishing, 2013), 12-16.

³⁹⁷ Cosslett and Cosslett, *Water Resources and Food Security in the Vietnam Mekong Delta*, 15.

³⁹⁸ Ian Johnson, "China's Great Uprooting: Moving 250 Million Into Cities," *NY Times* June 15 2013; "China Overview," *US Department of Energy*, 2014: <http://www.eia.gov/countries/cab.cfm?fips=CH>.

skyrocketing air pollution, the Chinese central government has mandated that a minimum of fifteen per cent of its energy mix is to be derived from renewable sources by 2020.³⁹⁹ This has already led to China being the world's largest hydropower producer and, in conjunction with the 'Great Western Development' campaign – sometimes known as 'go west' – has led Chinese hydropower developers to focus their attention on the vast potential hydropower reserves of Yunnan province.⁴⁰⁰

The hydropower potential of Yunnan province is indeed vast. It is estimated that Yunnan has a potential hydropower output of 90 GW.⁴⁰¹ To put this in perspective, this is over four times the amount of electricity produced by the massive Three Gorges Dam project on the upper Yangtze River, and more than the installed capacity of any of the three next largest hydropower producing nations: Brazil, the US and Canada.⁴⁰² Of Yunnan's immense potential, it is estimated that the Lancang Jiang could provide up to 25 GW of hydropower.⁴⁰³

Given the great demand and huge potential of the river, it is unsurprising that Chinese hydropower firms have been constructing hydropower projects in the upper Mekong over the last two decades. Over ninety per cent of the elevation drop of the total river occurs in the Chinese section, and the Lancang Cascade, a series of eight dams with an expected output of 15.5 GW, has been under construction since the early 1990s in order to take advantage of this.⁴⁰⁴ China's downstream riparians were not aware of the Manwan Dam, the first dam of the Lancang Cascade to be constructed, until near its completion in 1996.⁴⁰⁵ Since that time, five of the planned eight dams have been completed, with the sixth well under construction. Altogether,

³⁹⁹ Thomas Hennig et al., "Review of Yunnan's Hydropower Development: Comparing small and large hydropower projects regarding their environmental implications and socio-economic consequences," *Renewable and Sustainable Energy Reviews* 27(2013): 586.

⁴⁰⁰ Darrin Magee, "The Science of China's Hydropower" (paper presented at the International Symposium "Role of Water Sciences in Transboundary River Basin Management", Ubon Ratchathani, Thailand, 2005), 183.

⁴⁰¹ Hennig et al., "Review of Yunnan's Hydropower Development," 589.

⁴⁰² Hennig et al., "Review of Yunnan's Hydropower Development," 586; Peter H. Gleick, "Three Gorges Dam Project, Yangtze River, China," *Water Brief* 3(2008), <http://www.worldwater.org/data20082009/WB03.pdf>.

⁴⁰³ Magee, "The Science of China's Hydropower", 182.

⁴⁰⁴ Jean-Paul Bravard, Marc Goichot, and Hervé Tronchère, "An Assessment of Sediment-Transport Processes in the Lower Mekong River Based on Deposit Grain Sizes, the CM Technique and Flow-Energy Data," *Geomorphology* 207(2014): 176; Fu, He, and Lu, "Sedimentation in the Manwan Reservoir ": 91.

⁴⁰⁵ Evelyn Goh, "China in the Mekong River Basin: The regional Security Implications of Resource Development on the Lancang Jiang " (Singapore: Institute of Defence and Strategic Studies Singapore, July 2004). 4.

the dam cascade withholds a staggering 40 km³ of water, nearly ten per cent of the river's total annual flow at the Delta.⁴⁰⁶

The next section will examine the environmental effects that the Lancang Cascade has had on the Mekong system as a whole and the importance of these to those who live on and around the river.

Basin-wide Impacts of the Lancang Cascade: Localised impacts

As would be expected with such a large project, the impacts on the river of the Lancang Cascade have been significant. An International Rivers Network brief warned, in 2002, before the completion of the Dachaoshan Dam, that these dams would affect fisheries, dry and wet season flows, agriculture, and hinder the siltation process.⁴⁰⁷ A 2004 World Bank report echoed the warning, confirming that there were already significant irregular flows occurring hundreds of kilometres downstream from the Manwan Dam.⁴⁰⁸ As evidence has accumulated over the last decade, the extent of the impacts on the ecosystems of the river basin are now becoming clear.

Initially, very little information was available as to the impacts of the Lancang Cascade within China itself. In recent years, however, research has been published by the Chinese scientific community that examines the more localised impacts of the Cascade. This research has demonstrated that a dam within a cascade setting has a greater impact on its local environment than an isolated dam.⁴⁰⁹ Zhai et al., for example, studied the impacts of the Lancang Cascade on the river ecosystem integrity (REI) of the upper part of the Mekong, finding a post-cascade reduction in REI of over 65 per cent.⁴¹⁰ Soil erosion, water and sediment capture, fisheries habitat and riverbank stability were all considered as part of the REI. Disturbingly, it was also found that the pressure placed on the tectonic plates in the region by these

⁴⁰⁶ Lu et al., "Observed changes in the water flow," 147-48.

⁴⁰⁷ See: "China's Upper Mekong Dams Endanger Millions Downstream," in *Briefing Paper 3* (International Rivers Network, October 2002).

⁴⁰⁸ Geoff Podger and Richard Beecham, "Modelled Observations on Development Scenarios in the Lower Mekong Basin," in *Mekong Regional Water Assistance Strategy* (Vientiane: World Bank, November 2004). 107.

⁴⁰⁹ Hongjuan Zhai et al., "Prediction of River Ecological Integrity After Cascade Hydropower Dam Construction on the Mainstream of Rivers in Longitudinal Range-Gorge Region (LRGR), China," *Ecological Engineering* 36, no. 4 (2010): 362.

⁴¹⁰ Zhai et al., "Prediction of river ecological integrity," 369.

dams has the potential to cause an earthquake with a value of over 3.0 on the Richter Scale.⁴¹¹

This pressure is partly as a result of the construction of the massive 292 metre high Xioawan Dam, which alone withholds 15 km³ of water creating a reservoir with a surface area of 189 km².⁴¹² Li et al., who studied the ecosystem surrounding the dam reiterated the findings of Zhai et al. regarding the ecological disruption to the river system of the Lancang Cascade. Unsurprisingly, they found that the Xioawan's massive reservoir created a significant disruption to the surrounding ecosystem including loss of native vegetation at the same time as facilitating the invasion of exotic species.⁴¹³

In a subsequent investigation, Li et al. returned to the Xioawan Dam site to study the impact of the dam on the fisheries in the surrounding area. Baseline studies into the fisheries in the area before the construction of the dam found it to be "healthy and show(ing) little indication of anthropogenic disturbance"⁴¹⁴. Within one year of the dam beginning its operations, they found that it had significantly changed the hydrological regime of the river affecting water temperature, velocity, transparency, suspended substances and water flow.⁴¹⁵ The massive reservoir has slowed the river to a virtual standstill causing eutrophication and significant cooling in deeper sections of the river – where the depth has increased by up to 252 metres. Native fish species have been virtually wiped out in the reservoir, in part due to the blocking of migration routes and destruction of habitats, but also as a result of the introduction of non-native species.⁴¹⁶ It is predicted that this will lead to a loss of genetic diversity of the fisheries of the upper Mekong as well as a homogenisation of the remaining fish fauna. A similar study on the impacts of the Manwan Dam, closer to the Laotian border, found that the changes in water temperature and obstruction of the river have had a similarly negative impact on local fish populations, destroying habitats

⁴¹¹ Zhai et al., "Prediction of river ecological integrity," 363,68.

⁴¹² "Xiaowan Dam, A Reservoir for Progress " *Ministry of Water Resources of the People's Republic of China*, 16 September, 2002: http://www.mwr.gov.cn/english/news/200209/t20020916_100694.html.

⁴¹³ Li et al., "Effects of hydropower on upland vegetation."

⁴¹⁴ Jinpeng Li et al., "Effects of Damming on the Biological Integrity of Fish Assemblages in the Middle Lancang-Mekong River Basin," *Ecological Indicators* 34(2013): 101.

⁴¹⁵ Li et al., "Effects of damming on the biological integrity of fish assemblages," 100.

⁴¹⁶ Li et al., "Effects of damming on the biological integrity of fish assemblages," 101.

and disrupting spawning processes, putting a variety of fish species at significant risk of extinction.⁴¹⁷

The Lancang Cascade is having a significant impact on the ecosystems of the upper Mekong basin as the above section has made clear. For those that live in this area, the inundation of land due to the large reservoirs and the destruction of fisheries is of serious concern. The following sections will examine the impacts of the Lancang Cascade on the broader river basin, finding that this series of dams in the upper reaches of the river is affecting ecosystems as far away as the Delta.

Water Flow

The risks of changing the Mekong's flow have been recognised by the Lower Basin riparians in that one of the most important components of the *Mekong River Agreement*, signed by the four Mekong River Committee (MRC) member states, is *Article 6*, which ensures maintenance flows of the mainstream.⁴¹⁸ This issue was considered to be so important that a sub-document was signed outlining the details.⁴¹⁹ Apart from ensuring a minimum flow level in the dry season, the Agreement attempts to ensure that water extraction or diversion from the Mekong mainstream does not hinder the annual flood which is crucial for the reverse flow of the Tonle Sap River. As has already been observed, the Tonle Sap is reliant on the annual cycle of flooding which backs up near Phnom Penh in Cambodia. It would, in fact, be a disaster if the Mekong did not flood. The MRC goes to great lengths to point out in its Annual Flood Report that the economic benefits of flooding far outweigh the costs associated with flood damage.⁴²⁰ Given the importance of floods to fisheries, agriculture and livelihoods in the lower basin, significant disruptions to the flow regime of the river in this part of the basin would come with a very high price.

⁴¹⁷ Yujun Yi et al., "Influence of Manwan Reservoir on fish habitat in the middle reach of the Lancang River," *Ecological Engineering* 69(2014): 113, 16.

⁴¹⁸ "Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin," (Vientiane: Mekong River Commission, 5 April, 1995). The importance and relevance of the MRC will be discussed in greater detail below.

⁴¹⁹ "Procedures for the Maintenance of Flows on the Mainstream," (Mekong River Commission, 1995).

⁴²⁰ "Annual Mekong Flood Report 2008," (Vientiane: Mekong River Commission September 2009). See pages 3-20.

It must be kept in mind that China is not a signatory to the *Mekong River Agreement* and therefore not part of the MRC. From the Chinese perspective therefore, it has been argued that evening out the flow between wet and dry season in the upper section of the river will have benefits in terms of salinity intrusion at the Delta, navigation and trade in the dry season, flooding prevention in the wet season and provide a more reliable flow for irrigation.⁴²¹ These arguments are partly an attempt to justify the fact that the flow regime in the upper section of the LMB has been changed significantly since the construction of the first dams of the Lancang Cascade. One of the strongest assertions in this regards is that the difference between dry and wet season flows has decreased due to the practice of withholding water in the wet season in order to release it for hydropower production in the dry season.⁴²² This is a somewhat controversial subject in the hydrological community focused on the Mekong,⁴²³ but what is clear from the research is that the flow regime has certainly altered, although these changes are spatially and temporally uneven. For this reason, various reports are in conflict over the true impacts of the Lancang Cascade on the flow regime of the river. This is likely due to the great variation in flows that have occurred as a result of the infilling of the five dams that have been completed over the last two decades. Studies by Quang and Nguyen, and Kummu and Varis found that dry season flows increased significantly in the years immediately following the completion of the Manwan Dam⁴²⁴ and Lu and Siew recorded significant drops in the total discharge of the upper section of the river as the Manwan Dam was filling.⁴²⁵ Other authors link these changes in the flow regime with climate change rather than dam construction which certainly muddies the waters so to speak.⁴²⁶

⁴²¹ Podger and Beecham, "Development Scenarios", 15; Lu et al., "Observed changes in the water flow," 146.

⁴²² Shaojuan Li and Daming He, "Water Level Response to Hydropower Development in the Upper Mekong River," *AMBIO: A Journal of the Human Environment* 37, no. 3 (2008): 176.

⁴²³ See Li and He's discussion in: Li and He, "Water level response in the upper Mekong ": 170. See also Appendix 1 in: Lu Xi Xi, Wang Jian-Jun, and Carl Grundy-Warr, "Are the Chinese Dams to be Blamed for the Lower Water Levels in the Lower Mekong?," in *Modern Myths of the Mekong: A critical review of water and development concepts, principles and policies*, ed. Matti Kummum, Marko Keskinen, and Olli Varis (Helsinki: Water & Development Publications - Helsinki University of Technology, 2008), 49.

⁴²⁴ Kummum and Varis, "Sediment-related Impacts."; M Quang and PE Nguyen, "Hydrological Impacts of China's Upper Mekong Dams on the Lower Mekong River," (Independantly Published, 2003).

⁴²⁵ X. X. Lu and R. Y. Siew, "Water Discharge and Sediment Flux Changes Over the Past Decades in the Lower Mekong River: Possible impacts of the Chinese dams," *Hydrology and Earth System Sciences*. 10, no. 2 (2006).

⁴²⁶ Lu et al., "Observed changes in the water flow."

Even so, these authors acknowledge that the infilling of the massive reservoir of the Xiaowan Dam and the even larger reservoir 20km³ of the soon to be completed Nuozhadu Dam will certainly have an effect on the flow regime. Li and He, who compared the total storage capacity of the Cascade with average seasonal and annual flows, found that once the Xiaowan and Nuozhadu Dams are completed, the Cascade will have the capacity to withhold 100 percent of a season's flow in the upper basin.⁴²⁷ The MRC's recently released *Basin Development Strategy* also raises concerns over the massive 292 metre high Xiaowan and the under construction Nuozhadu Dams and their impact on sediment transfer and seasonal water flows.⁴²⁸ These dams are obviously significant to the flow regime in the upper basin. It is less certain, however, what impact they will have further down the river towards the delta and the Tonle Sap. Downstream riparians certainly have concerns about the negative effects of these dams. Given that a) the impacts described above have mostly occurred as a result of the first three dams; b) the combined storage of these is less than ten per cent of the combined storage of the Xiaowan and Nuozhadu, and; c) it is expected that these dams will take approximately ten years to fill, their concerns are understandable.⁴²⁹ The challenge is that understanding the exact influence of the Lancang Cascade on the important ecological systems of the Tonle Sap and the Delta is difficult to determine.⁴³⁰

Returning to the flow regime of the upper part of the river, many reports find variation between pre and post-dam water levels relatively insignificant on an annual scale, but much more significant on a daily and hourly scale.⁴³¹ This has an important but often overlooked impact on agriculture. Villages in the Laotian and northern Thai section of the river have, for generations, planted crops in the sedimentary soils on

⁴²⁷ Lu et al., "Observed changes in the water flow," 176.

⁴²⁸ M.R.C., "Integrated Water Resources Management-based Basin Development Strategy for the Lower Mekong Basin, 2011-2015," (Vientiane: Mekong River Commission, March 2011). 13.

⁴²⁹ Kate Lazarus et al., "An Uncertain Future: Biodiversity and Livelihoods along the Mekong River in Northern Lao PDR," (Bangkok, Thailand and Gland, Switzerland: The World Conservation Union (IUCN), 2006). 31.

⁴³⁰ The contribution of the upper section of the basin to the total annual flow at the delta is only 16%. This percentage obviously increases the closer the measurements are taken towards the Chinese border, for example, the upper section contributes 60% of the total flow in Vientiane. See: Li and He, "Water level response in the upper Mekong ": 176. Lu and Siew, "Water discharge and sediment flux changes." P.T. Adamson et al., "The Hydrology of the Mekong River," in *The Mekong: Biophysical Environment of an International River Basin*, ed. Ian C. Campbell (New York: Elsevier, 2009), 56; Lu et al., "Observed changes in the water flow," 146.

⁴³¹ Li and He, "Water level response in the upper Mekong ": 175-76; Lu and Siew, "Water discharge and sediment flux changes."

the banks and small islands of the Mekong during the dry or low river season.⁴³² This type of agriculture has evolved over many years and relies on the consistent low flow of the river during the dry season. As a result of the irregular releases of water following hydropower production activities upstream, these crops and gardens are now being regularly washed away before they can be harvested.⁴³³ This has the secondary effect of heavy bank erosion. Furthermore, "(c)omplaints about irregular water levels and reduced fish stocks have been commonplace since the completion of the first two dams"⁴³⁴.

Additionally, the capture of sediment by the dams of the Lancang cascade is having an effect on these riverside gardens which rely heavily on the silt deposits that flow from the upper basin. The loss of silt due to sediment capture behind the dams is exacerbated by the irregular water flows that washes away sediment and erodes gently sloping banks, areas that have traditionally been used for riverside gardens. The impacts of sediment capture have far wider effects on the basin as a whole, and the next section will examine this important issue in more detail.

Sediment Capture

As has already been observed, the Delta, in the southernmost part of Vietnam, has been built up over millennia by the deposit of fluvial sediment from the river and it is estimated that fifty per cent of the total sediment in the Lower Basin (LMB) travels from the Chinese section.⁴³⁵ This sediment is crucial to the Lower Basin for two primary reasons. Firstly, it builds up the delta, helping to protect it from both sea-level rise and salinity intrusion. Secondly, it acts as a natural fertiliser that has helped to make the Delta the second most productive rice growing region in the world, contributing hugely to the developing economy of Vietnam. The sediment capture of the Lancang Cascade poses significant risks to the long term viability of the Delta and prosperity of its residents.

⁴³² Tyson R. Roberts, "Downstream Ecological Implications of China's Lancang Hydropower and Mekong Navigation Project," (Berkeley: International Rivers, 2001), 8.

⁴³³ "Assignment Earth: The Mekong Part 1," in *Assignment Earth* (Qatar: Al Jazeera, 23 June, 2007).

⁴³⁴ Shi Jiangtao, "Contentious Dam Begins Power Generation," *South China Morning Post* June 23, 2008; "Chinese Dams Disrupt Mekong Lives " (Qatar: Al Jazeera, 18 June 2007).

⁴³⁵ Avijit Gupta, "Geology and Landforms of the Mekong Basin," in *The Mekong: Biophysical Environment of an International River Basin*, ed. Ian C. Campbell (New York: Elsevier, 2009), 37-38. Fu, He, and Lu, "Sedimentation in the Manwan Reservoir ": 92; Bravard, Goichot, and Tronchère, "Assessment of sediment-transport in the Lower Mekong," 176.

An important part of measuring the sediment load of a hydropower dam is to establish its trapping efficiency (TE), or the percentage of the total sediment load of any given section of the river that is captured behind the dam.⁴³⁶ The TE is strongly related to the residence time (RT) of the reservoir, or the time it takes for the average particle or water molecule to travel through the reservoir.⁴³⁷ This can vary from a few days for so-called 'run-of-river' dams to several months for larger dams. The longer the RT, the higher the TE: The larger and longer the reservoir, the slower the water moving through it, the less turbulence, and therefore the greater the opportunity the sediment has to settle to the bottom of the reservoir. In the case of the Lancang Cascade, the enormous heights of both the Xiaowan (292 m) and Nuozhadu (261 m) Dams are designed to take advantage of the large drop in elevation through the narrow gorges in the Yunnan section of the river, creating a much greater hydropower potential.⁴³⁸ This makes for long and narrow reservoirs, as indicated by the Xiaowan's reservoir which covers a surface area of 189 km² but stretches back 178 km from the dam wall.⁴³⁹

The first dam to be built across the Mekong mainstream, the Manwan Dam, was understandably also the first to be studied in depth in regards to sediment capture. The initial measurements of sediment build up in the Manwan reservoir found that the reservoir bed had been raised by 30 metres within the first three years. This same study found that "after three years, the siltation rate and loss of active storage had reached rates expected for the 5th and 15th years respectively".⁴⁴⁰ Observations taken between 1993 and 2003 found that the dam trapped around 295-313 million tonnes of sediment during this period, around twenty-two per cent of the total reservoir capacity, resulting in an estimated TE of 60.5 per cent.⁴⁴¹ This has led to estimates that the dam may reach the end of its usefulness as a hydropower generating operation as early as 2025.

⁴³⁶ Kummu et al., "Basin-wide sediment trapping efficiency," 181.

⁴³⁷ "Glossary of Climate Change Terms," *United States Environmental Protection Agency*, 2013: <http://www.epa.gov/climatechange/glossary.html>; Rajeev Sah, "Mekong Erosion, Hydropower Development and Sediment Trapping by the Reservoirs" (Helsinki Metropolia University of Applied Sciences, 2013).

⁴³⁸ The Xiaowan Dam is highest arch dam in the world. The Yunnan section of the river is 1240 km long, dropping 1780 m in height. Li et al., "Effects of damming on the biological integrity of fish assemblages," 95.

⁴³⁹ Li et al., "Effects of damming on the biological integrity of fish assemblages," 95.

⁴⁴⁰ Fu, He, and Lu, "Sedimentation in the Manwan Reservoir": 94.

⁴⁴¹ Kummu and Varis, "Sediment-related Impacts," 280. See also: Fu, He, and Lu, "Sedimentation in the Manwan Reservoir": 94-95.

The Manwan Dam, with a reservoir area of 23.6 km², has a RT of 0.009 (just over three days), but given that its total storage capacity is just six per cent of that of the Xiaowan Dam and four per cent of the Nuozhadu, it is crucial to understand the impact that these two reservoirs are expected to have on the sediment load of the Mekong once they are fully operational.⁴⁴² Kummu and Varis initially estimated the TE of both of these mega dams at 92 per cent each with the Lancang Cascade as a whole withholding a stunning 94 per cent of the total sediment load of the Upper Basin.⁴⁴³ In a subsequent study they slightly decreased the estimated TE of the Xiaowan and Nuozhadu reservoirs to 89 per cent each, but found that the Lancang Cascade still has the potential to withhold 72 Mt of the total annual upper basin sediment load of 90 Mt.⁴⁴⁴ This is approximately half of the sediment load of the entire MRB, tributaries included.

This is a result of the long reservoirs of both of these dams creating an RT of 0.223 (81 days) for the Nuozhadu and 0.257 (nearly 94 days) for the Xiaowan Dam. As already suggested, this is highly problematic for the sediment load at the Delta which relies on the consistent flow of sediment for progradation (growth).⁴⁴⁵ Of even more concern is the relationship between Delta stability and sand, as sand has “extreme importance for the stability of the delta shoreline in Vietnam”⁴⁴⁶. Sand is one of the heaviest elements of a river’s sediment load and is therefore also one of the quickest elements to deposit on the bottom of the reservoir. Due to the long RT and high TE of the two largest Lancang dams, it is predicted that *all* of the sand coming down from the Chinese section of the river will be captured by the Lancang Cascade.⁴⁴⁷ The removal of this sediment creates ‘hungry’ or sediment starved waters, which then have a much stronger erosive effect on the river’s bed, creating ‘lateral expansion’ or bank erosion. It has been suggested that “the trapping of sediments by dams in China may eventually lead the Mekong to be a rock-cut canyon” due to the

⁴⁴² Fu, He, and Lu, "Sedimentation in the Manwan Reservoir ": 95. For comparative reservoir sizes see: Lu et al., "Observed changes in the water flow," 147.

⁴⁴³ Kummu and Varis, "Sediment-related Impacts," 291.

⁴⁴⁴ Kummu et al., "Basin-wide sediment trapping efficiency," 189-92.

⁴⁴⁵ Bravard, Goichot, and Tronchère, "Assessment of sediment-transport in the Lower Mekong," 176.

⁴⁴⁶ Bravard, Goichot, and Tronchère, "Assessment of sediment-transport in the Lower Mekong," 174.

⁴⁴⁷ Bravard, Goichot, and Tronchère, "Assessment of sediment-transport in the Lower Mekong," 186.

lack of sediment transfer between the upstream and downstream sections of the river.⁴⁴⁸

The effect of the Lancang Cascade capturing the river's sediment is to increase the speed at which the natural subsidence of the Delta occurs, known as 'accelerated subsidence'.⁴⁴⁹ This creates a scenario whereby deltas experience "apparent" or effective sea-level rise which may be greater than eustatic (or normal) sea-level rise.⁴⁵⁰ Although the Delta is already facing pressure from sea-level rise,⁴⁵¹ it would appear that the Lancang cascade is exacerbating this, contributing to the 'sinking' of the Delta at a rate twice the speed of current eustatic sea-level rise.⁴⁵² This can be expected to accelerate as dam building continues and the large reservoirs of the Xiaowan and Nuozhadu fill with sediment over the coming decades.

The most serious impacts on the Delta of sea-level rise are inundation, coastal erosion and salinity intrusion which have the potential to force population movements in the not-too-distant future. Most of the Delta is below two metres above sea-level so even slight sea-level rise could have large impacts.⁴⁵³ Coastal erosion is already having a significant impact on the Delta with some sections of coastline eroding at a rate of 30-50 metres per year.⁴⁵⁴ This creates a feedback loop whereby coastal erosion then creates greater vulnerability to sea-level rise and the impacts of storms and flooding, because, as the coastline recedes, there is less protection from these events for the population inland, often due to the loss of protective mangrove forests. Floodwaters, tidal and storms surges, and salinity have the ability to penetrate further inland which in turn add to coastline recession.

The second significant impact of silt capture behind the Lancang cascade is the removal of natural fertiliser. The result of this is that farmers either compensate for

⁴⁴⁸ Kummu and Varis, "Sediment-related Impacts," 288.

⁴⁴⁹ Jason P. Ericson et al., "Effective Sea-level Rise and Deltas: Causes of change and human dimension implications," *Global and Planetary Change* 50(2006). 66.

⁴⁵⁰ Ericson et al., "Effective Sea-level Rise." 65.

⁴⁵¹ Reiner Wassmann et al., "Sea Level Rise Affecting the Vietnamese Mekong Delta: Water Elevation in the Flood Season and Implications for Rice Production," *Climatic Change* 66(2004): 90.

⁴⁵² Ericson et al., "Effective Sea-level Rise." 64.

⁴⁵³ "Position Analysis: Climate Change, Sea-level rise and Extreme Events: Impacts and Adaptation Issues," (Hobart: Antarctic Climate and Ecosystems Cooperative Research Centre, 2008), 11; Wassmann et al., "SLR Mekong Delta," 90.

⁴⁵⁴ Pham Thi Thuy Hanh and Masahide Furukawa, "Impact of Sea Level Rise on Coastal Zone of Vietnam," *Bull. Fac. Sci University of Ryukyus* 84(2007). 55.

the loss of this natural fertiliser with expensive industrial fertilisers, or crop yields decrease. A reduction in rice production in the Delta will have food security implications for much of Asia.

Although Chinese engineers have concluded that “the Xiaowan project will have limited impacts on the lower reaches of the river”⁴⁵⁵, the evidence above strongly contradicts this. Clearly the impacts of sediment capture by the Lancang cascade has significant and serious consequences for the 17 million people living in the Delta and the millions who rely on the Tonle Sap for their livelihoods and subsistence. This is a strong demonstration of why a holistic view of the river must be taken into account when examining the Mekong. Looking at dams in isolation and taking into account only the immediate area surrounding a dam is clearly an inadequate means of making an assessment about its impacts.

Section 2: Security and the Lancang Cascade

It is clear that Chinese developers are monopolising the water and silt of the upper Mekong that has traditionally formed part of a healthy ecosystem, providing environmental services, livelihoods and subsistence to millions throughout the entire Mekong River Basin. The Lancang Cascade brings with it significant environmental impacts as a result of this monopolisation of resources, and the section above has carefully outlined the current scientific knowledge on the subject, examining the environmental impacts both in the immediate area surrounding the Cascade and as far to the south as the Delta. This scientific detail provides no insight into the political and security ramifications of the dams, however. Within the scientific literature there are occasional vague references to the possibility of national security concerns, conflict or human security problems, but no engagement with the political or security literature. This is not necessarily a criticism of the scientific literature, but instead, an observation that the science alone, no matter how clear about the environmental outcomes of a given situation, is not sufficient to provide security insights on that same situation.

This section returns the thesis to the security discourse in order to understand the ways in which the Lancang Cascade has been perceived from a security perspective and whether environmental security has played a part in this. As shall be

⁴⁵⁵ "Xiaowan Dam, A Reservoir for Progress".

demonstrated, environmental security is an almost non-existent element of the security discourse surrounding these issues. The majority of analyses give a brief overview of the environmental challenges and then switch to either a realist or liberal institutionalist analysis of the political and economic issues. The environment as an entity fades into the background and becomes relatively insignificant to the discourse.

This section will therefore be broken into two, looking firstly at the traditional security perspectives of the Lancang Cascade, followed by liberal institutional perspectives. Traditional perspectives tend to focus on China as responsible for downstream negative environmental occurrences, blaming China for its relative over-exploitation of the common pool resources of the Mekong. This occurs in both public discourse – usually through standard media outlets and blogs – and through academic analyses of the Lancang Cascade and China’s perceived poor performance in international relations.⁴⁵⁶ Liberal institutionalism asserts that the lack of conflict regarding the dams is due to the cooperative nature of the multilateral institutions that have developed over previous decades – particularly the Mekong River Commission and the Greater Mekong Subregion. Following this, the need for a systemic environmental security approach to these issues will be considered.

Traditional Views

There is little doubt that China views the construction of the Lancang Cascade as a national security issue, giving scant consideration for its impacts outside of China’s own borders.⁴⁵⁷ There has been sustained criticism of the Lancang Cascade since it was first revealed to the world in the mid-nineties.⁴⁵⁸ Several events in particular have triggered the most heated criticism. In 2003-04, water levels in the Golden Triangle region, in the upper reaches of the lower basin, fell to the lowest levels seen since the infilling of the Manwan Dam in 1994-95.⁴⁵⁹ Locals were quick to blame their

⁴⁵⁶ Timo Menniken, "China's Performance in International Resource Politics: Lessons from the Mekong," *Contemporary Southeast Asia: A Journal of International and Strategic Affairs* 29, no. 1 (2007).

⁴⁵⁷ Goh, "Developing the Mekong," 42; Brahma Chellaney, *Water: Asia's New Battleground* (Georgetown University Press, 2011), 262.

⁴⁵⁸ "The Mekong Region's Politics of Power," *The Phnom Penh Post*, 20 October, 1995: <http://www.phnompenhpost.com/national/mekong-regions-politics-power>; Macan-Markar, "Environment: Blame on Chinese Dams Rise as Mekong River Dries Up."

⁴⁵⁹ "Mekong River: Chinese Dams Cause Water Level to Recede," *Bangkok Post* 15 February, 2004; Wain, "Depleted Mekong River Draws Concern."

“domineering upstream neighbour”⁴⁶⁰ for the low water, while also linking years of declining fish stocks with the upstream dams. At a forum focused on the Chinese dams, local Thai fishermen expressed the growing anti-Chinese sentiment in the northern reaches of the Mekong: “It seems the government is afraid of mighty China and dares not touch China’s development projects despite the impacts on the livelihood of millions of people in the lower Mekong basin”⁴⁶¹. Chinese dams have also been “suspected” as the culprits for increased flooding in and around Chiang Rai in 2008 and 2014.⁴⁶²

In 2010, the water levels in the Mekong, particularly around Vientiane, again fell to critically low levels, capturing the attention not only of locals, but also the international media.⁴⁶³ The low water levels coincided with the infilling of the massive reservoir of the Xiaowan Dam which was blamed by those living in the region for the low water in the upper Mekong.⁴⁶⁴ Once again, “China’s intransigence”⁴⁶⁵ and hegemonic activity were blamed for the low water levels, although China itself deflected these claims and instead blamed climate change for a severe drought in its south-western regions.⁴⁶⁶ In an unusual move, and due to the sustained criticism, China sent envoys to its Southeast Asian neighbours to try to assuage fears that it was responsible for the low water, though this action was met with cynicism by some.⁴⁶⁷

⁴⁶⁰ Michael Coren, "Going against the Flow? Power and Politics on the Mekong," *The Phnom Penh Post*, 31 January, 2003: <http://www.phnompenhpost.com/national/going-against-flow-power-and-politics-mekong>.

⁴⁶¹ Kultida Samabuddhi, "Mekong River: Chinese Dams Upstream Blamed for Drastic Decline in Fish Stock," *Bangkok Post* 10 March, 2004.

⁴⁶² "Thailand: Worst Mekong River Flooding in 100 Years " *Integrated Regional Information Networks (IRIN)*, 18 August, 2008: <http://www.irinnews.org/report/79869/thailand-worst-mekong-river-flooding-in-100-years>; "Chinese Dam Could Flood Chiang Rai," *Bangkok Post* 21 September 2014.

⁴⁶³ Thomas Fuller, "Countries Blame China, Not Nature, for Water Shortage," *The New York Times*, April 1, 2010: http://www.nytimes.com/2010/04/02/world/asia/02drought.html?_r=0; "Mekong Waters Hit Record Low: Villagers downstream blame Chinese dams as vital Asian river slows to a trickle.," *Al Jazeera English*, 8 Mar, 2010: <http://www.aljazeera.com/news/asia-pacific/2010/03/20103884320526422.html>.

⁴⁶⁴ Callum MacLeod, "China's New Dam Seen As a Water Hog," *USA Today*, 22 April, 2010: http://usatoday30.usatoday.com/news/world/environment/2010-04-21-china-dam_N.htm; Brain McCartan, "When the Mekong Runs Dry," *Asia Times Online*, Mar 13, 2010: http://www.atimes.com/atimes/Southeast_Asia/LC13Ae01.html.

⁴⁶⁵ "Dams Portend Grim Future for Mekong Delta: Experts," *Thanh Nien News*, April 09, 2010: <http://www.thanhniennews.com/politics/dams-portend-grim-future-for-mekong-delta-experts-16974.html>.

⁴⁶⁶ Cheng Guangjin and Ma Liyao, "Climate Change to Blame for Mekong Drought," *China Daily*, 3 April, 2010: http://www.chinadaily.com.cn/world/2010-04/03/content_9684768.htm.

⁴⁶⁷ Fuller, "Countries Blame China."

What is significant about the dry water levels of 2010 is that there is no doubt that China was indeed suffering from a prolonged and severe drought in Yunnan.⁴⁶⁸ At the same time as it was dealing with international criticism in regards to the Lancang dams, Beijing was receiving condemnation from domestic sources in regards to its lack of preparation and ability to deal with drought within its own borders.⁴⁶⁹ It would therefore appear that China had a genuine justification – at least in part – for abrogating its responsibility for the low water in the upper Mekong in 2010. However, due to its long-standing lack of cooperation on Mekong issues, and coupled with the assessed likely impacts from the Xiaowan Dam, it is hardly surprising that these attempts at shifting the blame were met with scepticism from downstream riparians. Indeed, even the MRC was criticised for accepting China's version of events.⁴⁷⁰

Although public opinion and the perspective of the media do not necessarily influence the policy direction of governments, particularly in socialist and communist states, they nevertheless provide insight into the popular sentiment in one country regarding the actions of another. Biba believes that this rising popular resentment and media assertiveness in the downstream riparian countries “will at some point put immense pressure on the central governments of the downstream riparian's to do more about China's plans”⁴⁷¹. Exactly what and how much influence they might have is uncertain, but what is clear, is that a range of commentators link China's behaviour in regards to Mekong issues with traditional or realist accounts. Menniken, for example, perceives the problem from a game theory perspective, viewing China as the “stereotype of an upstream riparian... able to reap all the benefits and fully export the damages”⁴⁷². In the case of the Lancang cascade, China is the “Rambo” of this game, having the geophysical, political, military, and economic dominance in the region, making cooperation improbable. This lack of cooperation is highlighted by

⁴⁶⁸ Willy Lam, "China's Ecological Woes: Drought and Water Wars?," *China Brief - The Jamestown Foundation* 10, no. 7 (April 1, 2010); "Official: Drought Situation Grave for April," *China Daily*, 3 April, 2010: http://www.chinadaily.com.cn/china/2010-04/03/content_9684946.htm; "Drought to Get 'More Serious' " *China Daily*, April 1, 2010 http://www.chinadaily.com.cn/china/2010-04/01content_9671752.htm.

⁴⁶⁹ "Yunnan Braces for the Worst Drought in a Century," *China Daily*, 29 March, 2010: http://www.chinadaily.com.cn/imqq/2010-03/29/content_9657505.htm; Peng Yining, Li Yingqing, and Hu Yongqi, "Water, Water, Everywhere But ..." *China Daily*, 30 March, 2010.

⁴⁷⁰ "Dammed If You Do," *Thanh Nien News*, July 02, 2010: <http://www.thanhniennews.com/society/dammed-if-you-do-15831.html>.

⁴⁷¹ Sebastian Biba, "China's Continuous Dam-building on the Mekong River," *Journal of Contemporary Asia* 42, no. 4 (2012): 623.

⁴⁷² Menniken, "China's performance in international resource politics," 101.

China's withdrawal from the process of the World Commission on Dams and its refusal to become a member of the Mekong River Commission (MRC).⁴⁷³ In Menniken's opinion, "China is therefore an essentially realist actor, focusing on pivotal categories like power, scepticism, and reciprocity"⁴⁷⁴. Even when China *does* engage in institutional arrangements and discussion, he believes they are still following an essentially realist mindset.⁴⁷⁵

This point of view echoes the thoughts of Liebman who questions China's own assertions of a "peaceful rise". Liebman uses the case of the Lancang cascade to test the "high standards set by (China's) own words"⁴⁷⁶ coming to the conclusion that, given its lack of cooperation and unwillingness to pay a price for it, China is acting in a similar way to any powerful nation in a similar situation. Although China could shift this impression by increasing cooperation, giving consideration to the impacts of its dams downstream, and being willing to pay a cost for this, it essentially shows little interest in such behaviour and therefore demonstrates itself to be a self-interested power-maximising actor. Similarly, Sinha sees China's hydropower development from a realist perspective, describing its approach as "unilateral, allowing little space for dialogue and accommodation"⁴⁷⁷. China is, he believes, clearly demonstrating hegemonic behaviour that can be described as "dominance by coercion"⁴⁷⁸.

Others focus on the geographical and ecological hegemony of China created by the Lancang cascade. In particular, the giant Nuozhadu and Xiaowan Dams which give China almost total control over the seasonal flows of the Mekong. Ott, for example, demonstrates deep concern for this issue:

The security implications could hardly be greater for the downstream states. With the dams, China will have literal control over the river system that is the lifeblood of Laos,

⁴⁷³ See: Biba, "China's Continuous Dam-building."

⁴⁷⁴ Menniken, "China's performance in international resource politics," 102.

⁴⁷⁵ Menniken, "China's performance in international resource politics," 111.

⁴⁷⁶ Alex Liebman, "Trickle-down Hegemony?: China's "Peaceful Rise" and Dam Building on the Mekong," *Contemporary Southeast Asia: A Journal of International and Strategic Affairs* 27, no. 2 (2005): 299.

⁴⁷⁷ Uttam Kumar Sinha, "Examining China's Hydro-Behaviour: Peaceful or Assertive?," *Strategic Analysis* 36, no. 1 (2012): 53.

⁴⁷⁸ Sinha, "Examining China's Hydro-Behaviour," 51.

Cambodia, and Vietnam. The power this gives China is equivalent to an invasion and occupation of the country by the Chinese Army.⁴⁷⁹

Cronin reveals similar anxiety on the subject suggesting that there is potential for a significant backlash against Beijing if Chinese developers transform the Mekong into the same state as the essentially ecologically dead Yangtze and Yellow Rivers.⁴⁸⁰ If the status quo remains the same, there is no reason to believe that China will change its current attitude to the river, and downstream riparians can expect it to “regulate the resource to suit its needs first...impact(ing) everything from fish migration triggers to agricultural cycles, and the shipping operations of Southeast Asian companies especially in Thailand and Laos”⁴⁸¹.

Conflict between states? National Perspectives

Potentially the most serious security implication – as well as the most clearly linked to realist theory – of the Lancang Cascade would be armed conflict between nations. One commentator suggests that the combination of climate change, water shortages and the Chinese dams risks “future geopolitical conflict over the region’s lifeblood, Mekong river water”⁴⁸² – thinking that parallels with that of Kaplan and Klare as described in the literature review. Other authors suggest that China’s non-membership of the MRC and unilateral action on hydropower development in the upper basin are fertile causes for conflict.⁴⁸³ As Pearse-Smith observes though, a deeper consideration of the issues, the relationships between nations and the power disparities in play leads to the conclusion that actual armed conflict is extremely unlikely.⁴⁸⁴

Even so, the situation of China’s emerging regional hegemony has caused consternation both within and outside the region, and has “been sufficient to cause

⁴⁷⁹ Russell Sticklor, "Managing the Mekong: Conflict or Compromise?," in *New Security Beat*, Woodrow Wilson International Center for Scholars (Washington DC: Wilson Centre – Environmental Change and Security Program, December 1, 2010).

⁴⁸⁰ Richard Cronin, "Mekong Dams and the Perils of Peace," *Survival* 51, no. 6 (2009): 157.

⁴⁸¹ Cronin and Hamlin, "Mekong Tipping Point", 29.

⁴⁸² Henry Hoyle, "Trouble Brewing in the Mekong Basin," in *Foreign Policy Blogs* (Foreign Policy Association, April 1, 2010).

⁴⁸³ Michael Buxton, Jennifer Martin, and Max Kelly, "Conflict Resolution and Policy Making Mediation in the Mekong River Basin," *Just Policy: A Journal of Australian Social Policy*, no. 41 (2006); Jörn Dosch, "The Fallacy of Multilateralism Rhetoric in China-Southeast Asian Relations. A neo-realist perspective on regional order building," *UNISCI discussion papers*, no. 24 (October, 2010): 142-43.

⁴⁸⁴ See: Scott W.D. Pearse-Smith, "'Water war' in the Mekong Basin?," *Asia Pacific Viewpoint* 53, no. 2 (2012).

the United States to emerge from its post-Vietnam geopolitical torpor⁴⁸⁵ according to Cronin. Indeed, concern about China's regional influence and how this plays out through hydropower construction on the Lancang can be found at the highest levels in the US: Cronin was called before a US Congressional Hearing on the activities of China in Southeast Asia to give evidence in regards to Chinese hydropower projects in the Mekong.⁴⁸⁶ In 2011, former Secretary of State Hillary Clinton launched the *Friends of the Lower Mekong* initiative, putting forward a US\$221 million assistance fund for education, environment, health and infrastructure projects. Mekong expert, Milton Osborne, described the policy as a counterbalance to Chinese influence in the region: "The continuing rise of China in economic terms is clearly a concern for the United States...(and) the Mekong initiative is one of several ways the United States is making clear that it is continuing to have a broad interest in this part of the world"⁴⁸⁷. This balancing behaviour can be read into Clinton's statements at the launch of the initiative: "We are sending a clear message to the people of Cambodia, Laos, Thailand and Vietnam: We are invested in your well-being and continued progress"⁴⁸⁸. More recently, U.S. Secretary of State, John Kerry, visited Vietnam's Mekong Delta to launch a U.S. funded climate change initiative where the issue of hydropower projects was brought up explicitly: "No one country has a right to deprive another country of the livelihood and the ecosystem and its capacity for life itself that comes with that river"⁴⁸⁹.

U.S. interest in China's hydropower development is understandable in the context of the U.S. "pivot" or rebalancing towards East Asia. The Lancang dams, however, play just a small part in the overall security concerns of the U.S. in Asia and are presumably a long way down the priority list from other critical issues such as those that are occurring on the South China Sea. It would be expected, on the other hand, that the Lancang Cascade is a much higher security concern for the Lower Mekong

⁴⁸⁵ Cronin and Hamlin, "Mekong Tipping Point", 28.

⁴⁸⁶ Daniel M. Slane Chairman, "China's Activities in South-East Asia and the Implications for U.S. Interests," ed. U.S. – China Economic and Security Review Commission (WashingtonMarch, 2010).

⁴⁸⁷ Brian Padden, "US Assistance Aims at Preventing Cross-Border Conflict in Mekong Region," *Voice of America*, August 1, 2011: <http://www.voanews.com/content/us-assistance-to-mekong-region-aimed-at-preventing-cross-border-conflict-126573368/143185.html>.

⁴⁸⁸ Eric Bellman and Patrick Barta, "Amid Efforts on Korea, U.S. Seeks Asia Inroads," *The Wall Street Journal*, July 23, 2011: <http://online.wsj.com/news/articles/SB10001424053111904233404576461881890286572>.

⁴⁸⁹ "Kerry Talks Trade, East Sea and Mekong River in Vietnam," *Thanh Nien News*, December 16, 2013: <http://www.thanhniennews.com/politics/kerry-talks-trade-east-sea-and-mekong-river-in-vietnam-370.html>.

riparians. But although the media sources above indicate that Mekong citizens are deeply concerned about the Cascade and its impacts throughout the region, the rhetoric of Lower Mekong riparian governments does not appear to marry with these popular views, putting suggestions of conflict between downstream riparians and China in serious doubt.

At least in respect to Cambodia, U.S. concerns regarding China's growing influence may well be justified. After struggling to find loans from Western financial institutions such as the World Bank due to growing concerns over the environmental impacts of hydropower projects, Cambodia instead turned to China for technical assistance and finance.⁴⁹⁰ China has already completed the construction of one dam in Cambodia and has four other projects currently under construction. Chinese loans and grants to Cambodia, including increasing military aid, reached U.S. \$2.7 billion by 2012, making China second only to Japan on the list of Cambodia's donors.⁴⁹¹

Increasingly, this has led to the Cambodian government privileging Chinese interests including the establishment of "special economic zones". Burgos and Ear suggest that "China's goal is (to build) solid allegiances to advance its agendas related to foreign policy, image shaping, economic pre-eminence, and national security. All these instruments play out in Cambodia"⁴⁹².

The evidence suggests that Chinese investments in Cambodia is certainly paying dividends. In 2009, on the day before a state visit from then Chinese Vice President Xi Jinping, Cambodia deported to China twenty asylum seekers from the ethnic Uighur community who had fled to Cambodia to escape a Chinese government crackdown.⁴⁹³ In late 2012, Cambodia controversially supported Chinese interests in the South China Sea at an ASEAN summit causing heated disagreement and a failure of the leaders to issue a joint communiqué at the end of an ASEAN summit for

⁴⁹⁰ Catherine Beck, "The Push and Pull for Hydropower in Vietnam and Cambodia," in *China Environment Forum* (Washington: Wilson Centre 2013), 6-7.

⁴⁹¹ Heng Pheakdey, "Chinese Investment and Aid in Cambodia a Controversial Affair," in *East Asia Forum*, ed. Shiro Armstrong and Peter Drysdale (Canberra: East Asian Bureau of Economic Research, 16 July, 2013); Vong Sokheng, "China Steps up Military Aid," *The Phnom Penh Post*, 24 January, 2013: <http://www.phnompenhpost.com/national/china-steps-military-aid>.

⁴⁹² Sigfrido Burgos and Sophal Ear, "China's Strategic Interests in Cambodia: Influence and Resources," *Asian Survey* 50, no. 3 (2010): 626-27.

⁴⁹³ Seth Mydans, "20 Uighurs Are Deported to China " *The New York Times*, December 19, 2009: http://www.nytimes.com/2009/12/20/world/asia/20uighur.html?_r=0.

the first time in history.⁴⁹⁴ And in 2013, Cambodia, postponed scheduled exercises with the U.S. military, raising questions within the U.S. establishment about the role of China in the decision.⁴⁹⁵

This is fascinating in terms of growing Chinese influence in the region and Cambodia's relationship with China, but what is relevant to this thesis, is the impact that this has on Cambodia's opinion of Chinese hydropower developments. As has already been indicated, Chinese corporations are already in the process of constructing hydropower within Cambodia itself, but the most controversial of these planned dams is the Sambor Dam which, if constructed, is destined for the Mekong mainstream.⁴⁹⁶ Although Cambodia is heavily reliant on the Tonle Sap for its food security and the livelihoods of millions, and both the Lancang Cascade and Sambor Dam greatly jeopardise the ecosystems and fisheries that sustain a large proportion of the Cambodian people, the Cambodian elite appear to be generally unconcerned about the risks. In 2010, Hun Sen was quick to publicly defend China's role in the historically low water levels of the Mekong, instead blaming climate change and carbon emissions.⁴⁹⁷ As early as 1996, the official Cambodian position on hydropower projects was quite clear. A senior Cambodian representative to the MRC stated in regards to damming the mainstream: "Water is our oil, our mines of gold, our main natural resource...we must use our water to export, and get foreign currency to develop the country"⁴⁹⁸.

Far from the expected tension between Cambodia and China over the Lancang Cascade, Cambodia and China are in fact engaged in joint hydropower development within Cambodia itself, putting the interests of energy development over the

⁴⁹⁴ Patrick Barta, "Sea Dispute Upends Asian Summit," *The Wall Street Journal*, July 23, 2012: <http://online.wsj.com/news/articles/SB10001424052702303919504577524133983292716>.

⁴⁹⁵ John Blaxland, "Cambodia's 'Postponed' Exercises and the U.S. Pivot to Asia," in *The Strategist - The Australian Strategic Policy Institute Blog*, ed. David Lang (Canberra: Australian Strategic Policy Institute, 22 August, 2013).

⁴⁹⁶ Beck, "The Push and Pull for Hydropower", 7. See also: T. B. Wild and D. P. Loucks, "Assessing the Potential Sediment-Related Impacts of Hydropower Development in the Mekong River Basin," in *World Environmental and Water Resources Congress 2012*, ed. D. P. Loucks (Reston, Virginia: American Society of Civil Engineers, May 2012).

⁴⁹⁷ Thomas Miller and Cheang Sokha, "Hun Sen Denies China Dam Impacts," *The Phnom Penh Post*, 17 November, 2010: <http://www.phnompenhpost.com/national/hun-sen-denies-china-dam-impacts>; Ai Yang, "Cambodia: China Not behind Mekong Floods," *China Daily*, 19 November, 2010: http://www.chinadaily.com.cn/cndy/2010-11/19/content_11574678.htm.

⁴⁹⁸ Matthew Grainger, "'Water Is Our Gold' – the Battle of Words Begins," *The Phnom Penh Post* 8 March 1996.

requirements of life. Energy and foreign income are no doubt of crucial importance to the development of Cambodia, but the consequences of achieving this without due regard for the systems that sustain the lives of millions will undoubtedly have serious consequences for those who are already living in severe poverty. This point will be discussed in greater detail in subsequent chapters.

China has no such influence in Vietnam. The relationship between China and Vietnam has been strained for many years due to having fought several wars and most recently, the tensions and standoffs in the South China Sea, or East Sea as it is known in Vietnam.⁴⁹⁹ It would therefore be unsurprising if the Vietnamese government sought to harness the public and official rancour over the South China Sea issues by linking them with Chinese hegemonic activity on the Mekong. Surprisingly, this is not the case, and contrary to the public concern displayed regarding the Lancang Cascade, Vietnam is officially very quiet on Chinese hydropower. This may well be due to the fact that Vietnam is heavily reliant on hydropower for its energy requirements, the majority of its energy imports coming from China, including power generated from the Lancang Cascade.⁵⁰⁰ Vietnam already has over 260 hydropower projects with a total installed capacity of over 14,000 MW and in order to gain energy self-sufficiency, the Vietnamese government has mandated significant increases in its own hydropower capacity, planning an additional 30 major hydropower projects.⁵⁰¹ Although not as heavily involved in hydropower in Vietnam as other downstream riparians, China has already assisted in the construction of three dams, with a further five of the planned projects being built or financed by Chinese interests.⁵⁰² The relationship between the two nations is far

⁴⁹⁹ See for example: Carlyle A. Thayer, "China's New Wave of Aggressive Assertiveness in the South China Sea" (paper presented at the Conference on Maritime Security in the South China Sea, Center for Strategic and International Studies, Washington, D.C., June 20-21, 2011); "Vietnam Demands China to Stop Harrassing Ships," *Thanh Nien News*, June 9, 2011 <http://www.thanhniennews.com/2010/pages/20110610131412.aspx>; "Vietnam demands China release fishing boats" *Thanh Nien News*, May 25, 2012 <http://www.thanhniennews.com/index/pages/20120525-vietnam-demands-china-release-fishing-boats.aspx>.

⁵⁰⁰ China relies on Hydropower for 40% of its energy requirements: Claudia Kuenzer et al., "Understanding the Impact of Hydropower Developments in the Context of Upstream–downstream Relations in the Mekong River Basin," *Sustainability Science* 8, no. 4 (2013): 576; Oliver Hensengerth, "Vietnam's Security Objectives in Mekong Basin Governance," *Journal of Vietnamese Studies* 3, no. 2 (2008): 117.

⁵⁰¹ Kuenzer et al., "Understanding the Impact of Hydropower," 576; "Vietnam Makes PM Nod Mandatory for all Hydropower Projects," *Thanh Nien News*, November 15, 2013: <http://www.thanhniennews.com/society/vietnam-makes-pm-nod-mandatory-for-all-hydropower-projects-637.html>.

⁵⁰² Beck, "The Push and Pull for Hydropower", 3-6.

from stable, however, with construction halted on at least one Chinese built hydropower plant due to disagreements between Chinese developers and the Vietnamese government.⁵⁰³

Chinese tensions aside, what is often overlooked in regards to the negative impacts on the Mekong Delta from hydropower construction is that tributaries upstream of the Delta, known as the '3S' region, flow out of Vietnamese territory.⁵⁰⁴ This effectively makes Vietnam an upstream riparian to itself. This is controversial in that Vietnam has several dams on the Sesan River which also sit directly upstream from Cambodia. The Yali Falls Dam in particular has caused severe disruption to livelihoods for 8,500 Vietnamese upstream of the dam and has impoverished the lives of over 50,000 Cambodians living downstream.⁵⁰⁵ Ironically, the same environmental impacts that are occurring from the Mekong mainstream dams have affected Cambodians in the 3S region: irregular flows of water resulting in flooding and crop destruction; devastation of fisheries; sediment capture; severe erosion; and negative impacts on potable water. To exacerbate the problems, Vietnam has built a second dam on the same river, without consulting its downstream neighbours.⁵⁰⁶ Additionally, Vietnamese finance and engineering is also being used to develop hydropower in Laos and, surprisingly, a Vietnamese state-owned power company is expected to construct the Lower Sesan 2 Dam, in the Cambodian section of the Sesan River.⁵⁰⁷

Given that Vietnam is deeply involved in hydropower construction of its own, and in fact buys electricity from the Lancang Cascade, it is difficult to see how the Vietnamese leadership can be overly critical of the Lancang dams. It is perhaps

⁵⁰³ "Vietnam Ends Contract With Chinese Contractors Who Unilaterally Quit Power Project " *Tuoi Tre News - The News Gateway of Vietnam*, 21 August, 2014: <http://tuoitrenews.vn/business/21822/vietnam-ends-contract-with-chinese-contractors-who-unilaterally-quit-power-project>; Rod Sweet, "Vietnam Accuses China of Using Obsolete Technology on Power Projects," *Global Construction Review*, 2 September, 2014: <http://www.globalconreview.com/news/vietnam-accuses-china-using-obsolete83276567892826/>.

⁵⁰⁴ 3S stands for the Sesan, Srepok (Vietnamese) and Sekong (Laotian) rivers which are a crucial part of the Mekong's ecology contributing the second most amount of sediment to the Delta after the Yunnan/Qinghai region. See: Wild and Loucks, "Assessing the Potential Sediment-Related Impacts of Hydropower Development in the Mekong River Basin."

⁵⁰⁵ Andrew B Wyatt and Ian G Baird, "Transboundary Impact Assessment in the Sesan River Basin: The case of the Yali Falls Dam," *Water Resources Development* 23, no. 3 (2007).

⁵⁰⁶ Hensengerth, "Vietnam's Security Objectives," 116.

⁵⁰⁷ Wyatt and Baird, "Transboundary Impact Assessment in the Sesan River Basin: The case of the Yali Falls Dam," 51-56; Beck, "The Push and Pull for Hydropower", 4-5.

possible, however, to draw a distinction between the effects of tributary dams and those of the Lancang Cascade due to the deleterious impacts of the sedimentation capture and flow changes on the Delta. This argument would obviously be based around the critical importance of the Delta to Vietnam and the importance of protecting its ecological integrity and environmental services. Closer inspection shows that Vietnam is its own worst enemy in regards to the ecological health of the Delta, however. The agricultural boom that has turned the Delta into the abundant rice growing area that it is, has come with severe ecological impacts that threaten the long term sustainability of agricultural production and human habitation. Destruction of wetlands and mangrove forests, the construction of flood protection dikes, overfishing, pesticide pollution, sand dredging and water extraction are all putting pressure on the long-term viability of the Delta.⁵⁰⁸

The scientific section above indicated the importance of sand to the health of the Delta, yet illegal sand-dredging operations in the Delta are having negative effects by changing the depth of the Delta channels, increasing the severity of erosion.⁵⁰⁹ Of even greater concern is the groundwater extraction that occurs for agricultural, industrial and domestic use. As groundwater is removed from the sedimentary soils of the Delta, these sedimentary layers compact and subsidence occurs. Aquifers in Ca Mau province have decreased by 15 metres in a decade resulting in a “cone of depression now nearly 20 m below sea level”.⁵¹⁰ Of great concern is the subsidence occurring around Ho Chi Minh City and other cities within the Delta which are subsiding at rates of 4 cm per year.⁵¹¹ Given the speed at which Vietnamese development of the Delta is having such deleterious impacts on the biophysical processes and long term sustainability of the ecological services provided by the Delta, combined with Vietnam’s own hydropower developments and importation of the energy produced by the Lancang Cascade, there is little surprise that the Vietnamese government is very quiet in regards to the Lancang Cascade.

⁵⁰⁸ For a more detailed discussion see: Käkönen, "Mekong Delta at the Crossroads."; "Vietnam's Mekong Delta Pays Huge Ecological Toll for Agricultural Boom."; Hecker et al., "Case Study of the Nam Can District".

⁵⁰⁹ "Erosion Hits Thousands all Over Mekong Delta " *Viet Nam News*, September, 23 2014: <http://vietnamnews.vn/environment/260443/erosion-hits-thousands-all-over-mekong-delta.html>.

⁵¹⁰ Laura E. Erban, Steven M. Gorelick, and Howard A. Zebker, "Groundwater Extraction, Land Subsidence, and Sea-level Rise in the Mekong Delta, Vietnam," *Environmental Research Letters* 9, no. 8 (2014): 4.

⁵¹¹ Erban, Gorelick, and Zebker, "Groundwater Extraction," 4.

Similarly, Thailand is also heavily involved in hydropower construction and has come under sustained criticism from the Thai public due to some high profile projects, such as the Pak Mun Dam, that have had similar devastating effects to those of the Yali Falls Dam described above.⁵¹² Thai civil society is much freer to express opposition than Thailand's downstream riparian neighbours, and therefore Thailand has sought to assuage public concerns by exporting the harm of hydropower projects to neighbouring countries, particularly Laos.⁵¹³ The Nam Theun 2 Dam for example, the subject of attention for the next chapter, has been jointly constructed by the Electricity Generating Authority of Thailand (EGAT).

Although Thais have been the most vociferous about the impacts of Chinese mainstream dams in the upper reaches of the Mekong, Thailand also purchases energy generated by the Lancang Cascade, having recently signed a Memorandum of Understanding (MoU) with China to purchase 3,000 MW of Chinese energy.⁵¹⁴ Furthermore, Thai energy company GMS power has been actively involved in the construction of the Jinghong and Nuozhadu Dams, both part of the Lancang Cascade.⁵¹⁵ The power from the Jinghong Dam has been used predominantly for the Thai domestic market, with a 1070 km long power line directly linking the Jinghong Dam to Bangkok.⁵¹⁶ Even more controversially Thai hydropower company Ch. Karnchang Public Company is currently in the process of constructing the first Lower Mekong Basin mainstream dam, the Xayaburi Dam in Northern Laos.⁵¹⁷

⁵¹² Tira Foran and Kanokwan Manorum, "Pak Mun Dam: Perpetually Contested," in *Contested Waterscapes in the Mekong Region: Hydropower, Livelihoods, and Governance*, ed. Francois Molle, Tira Foran, and Mira Käkönen (London: Earthscan, 2009).

⁵¹³ "Mekong residents file petition aimed at derailing Laos' Xayaburi dam," *Bangkok Post* 15 October, 2014. Prominent civil groups from Thailand are the "Foundation for Ecological Recovery" (TERRAPER) and the "Save the Mekong Coalition". See: Milton Osbourne, "The Mekong - River Under Threat," in *Lowy Institute Paper 27* (Sydney: Lowy Institute for International Policy, 2009); Buxton, Martin, and Kelly, "Conflict resolution."

⁵¹⁴ Kuenzer et al., "Understanding the Impact of Hydropower," 576; Hensengerth, "Vietnam's Security Objectives," 117.

⁵¹⁵ Dianchi Chenbao, "China's State Council Approved Jinghong Dam Project," *Probe International*, April 27, 2004: <http://journal.probeinternational.org/2004/04/27/chinas-state-council-approved-jinghong-dam-project/>.

⁵¹⁶ Shi Jiangtao, "Contentious Dam Begins Power Generation," *International Rivers*, June 23, 2008: <http://www.internationalrivers.org/resources/contentious-dam-begins-power-generation-2904>.

⁵¹⁷ Pisit Changplayngam and Khettiya Jittapong, "Work Restarts at Xayaburi Dam in Laos -project leader," *Thomson Reuters*, Aug 16, 2012: <http://www.reuters.com/article/2012/08/16/entertainment-us-thailand-laos-xayaburi-idUSBRE87F09H20120816>.

Which brings us to Laos. In an attempt to become the “battery of Southeast Asia” or “Southeast Asia’s Kuwait”⁵¹⁸, Laos currently has ten dams (>10 megawatts) on the Mekong tributaries, with seven under construction and a further twenty-five at the planning stage. Ten of the planned dams are on the Mekong mainstream. According to the Government of Laos’ (GoL) Department of Energy Promotion and Development, a further thirty-five large dams are in the feasibility stage.⁵¹⁹ The Xayaburi Dam is currently under construction on the Laotian section of the Mekong mainstream about 350km upstream from Vientiane. Although presented as a “run-of-river” dam it would in fact block the Mekong with a forty-nine metre high, 830 metre long dam wall, creating a reservoir at least 60km in length.⁵²⁰ The Environmental Impact Assessment (EIA) for the Xayaburi Dam is extremely limited, assessing the impacts to a distance of only 10km downstream. No assessments are given as to the wider impacts on downstream hydrology, migratory fish and sediment loads.⁵²¹ Although two fish passes are proposed as part of the project, their potential effectiveness is highly questionable.⁵²²

To complicate matters, it has recently been reported that construction work has also begun on the Don Sahong Dam near the Khone Falls in Laos’ southernmost regions of the Mekong mainstream, just a few kilometres from the Cambodian border. The Don Sahong Dam will create a relatively modest 240MW of power but will block a vital part of the river for fish migration. A technical paper released by the MRC in 2002 warned of the serious implications of blocking the migration routes of fish on the mainstream, particularly in this region.⁵²³ A more recent report gives a clear indication as to the extent of damage to fisheries caused by this single dam: “If fish were unable to migrate above the Khone Falls, they would not be able to feed,

⁵¹⁸ Aviva Imhof, “A River of Heart,” *World Rivers Review* 22, no. 2 (June 2007). 2.

⁵¹⁹ “Electric Power Plants in Laos,” *Government of Lao PDR Department of Energy Promotion and Development*, July 2011: http://www.poweringprogress.org/index.php?option=com_jotloader&cid=10&Itemid=91.

⁵²⁰ Eric Baran et al., “Review of the Fish and Fisheries Aspects in the Feasibility Study of the Environmental Impact Assessment of the Xayaburi Dam on the Mekong Mainstream,” (WWF Greater Mekong, 31 March 2011). 4.

⁵²¹ Baran et al., “WWF Xayaburi Review”. 23.

⁵²² Baran et al., “WWF Xayaburi Review”. 28.

⁵²³ A.F. Poulsen et al., “Fish Migrations of the Lower Mekong River Basin: Implications for development, planning and environmental management,” in *MRC Technical Paper No. 8* (Phnom Penh: Mekong River Commission, 2002). 21

reproduce or complete other parts of their lifecycles above the Khone Falls⁵²⁴. This would significantly impact fisheries in Cambodia's Tonle Sap and the Mekong Delta as well as much further upstream from the dam. As with the Xayaburi Dam, it is highly improbable that fish passes will be effective in facilitating the sheer variety and quantity of fish in the Mekong.⁵²⁵ The Mekong is currently home to over 1500 fish species,⁵²⁶ and during peak fish migration season "at least 50,000 fish per minute are swimming past a given point on the Tonle Sap River"⁵²⁷. Essentially, any dam built on the Mekong with high expectations that a fish pass will be successful would be highly risky and experimental at best; reckless and irresponsible at worst. A technical report written for the MRC sums up the situation well: "On the mainstream, the choice therefore remains: fish or dams"⁵²⁸.

And the winner is...energy

The fact that the Lancang Cascade has not led to strong disagreements and hostile diplomatic relations in this part of the world that has experienced war between states for millennia is, at first glance, somewhat surprising. What this section has demonstrated, however, is that suggestions that interstate conflict might occur over the construction and operation of the Lancang Cascade, are highly implausible. Although a realist perspective may provide some insight into Chinese behaviour and China's growing regional influence, it would be a serious stretch to suggest that the construction of mainstream dams in the upper section of the Mekong River Basin constitutes a security threat from a traditional perspective. With the exception of Cronin, traditional security analyses fail to seriously attempt to come to grips with the complex environmental problems created by the construction of hydropower on the Mekong mainstream and how these might impact on more nuanced understandings of security. Instead, either environmental considerations fade into the background so that traditional security perspectives are able to hold their own, or pieces of the environmental puzzle are selected in order to fit a traditional picture. In the

⁵²⁴ Ian G. Baird, "The Don Sahong Dam: Potential Impacts on Regional Fish Migrations, Livelihoods and Human Health," in *POLIS Project on Ecological Governance* (Victoria, Canada: University of Victoria, August 2009). 21.

⁵²⁵ Baird, "The Don Sahong Dam". 25.

⁵²⁶ Podger and Beecham, "Development Scenarios". 115.

⁵²⁷ Gary Lee and Natalia Scurrah, "Power and Responsibility: The Mekong River Commission and Lower Mekong mainstream dams," (Sydney: Australian Mekong Resource Centre, University of Sydney; Oxfam Australia, October 2009), 27.

⁵²⁸ S. Sverdrup-Jensen, "Fisheries in the Lower Mekong Basin: Status and Perspectives," in *MRC Technical Paper No. 6* (Phnom Penh: Mekong Resource Centre, May 2002).

meantime, the serious environmental and social implications of the Lancang Cascade and their affects or potential impacts on security remain poorly conceived and understood.

Furthermore, from the perspective of Mekong riparian governments, there appears to be very little tension – at least in regards to hydropower construction. In addition to China’s mainstream dams, the GoL is already constructing its own mainstream dam – with nine more to follow, Cambodia is intent on building a mainstream dam, and all governments are heavily involved in the capture of the hydropower potential in the region. Little, if any, regard is given to the Mekong as a large and complex system providing difficult to quantify ecological services to tens of millions, including economic benefits through employment opportunities, food security, water security, fisheries, and perhaps most importantly, the basics of subsistence. This is most important because those who rely on the ecosystem services of the Mekong for their subsistence are the most vulnerable to the negative impacts of dam construction. The next chapter will examine these vulnerabilities in more detail. However, the final section of this chapter will focus on the security theory of liberal institutionalism, seeking to understand why Mekong riparians are so unsuccessful in understanding the Mekong as a complex ecological system.

Section Three: Development and Institutions - The Mekong River Commission and the Greater Mekong Subregion

The science in the first part of this chapter indicates that there are serious threats to the long-term sustainability of the ecosystem services of the Mekong river basin if construction of hydropower in the upper section of the Mekong River continues unabated. Nevertheless, China is continuing its construction of the Lancang Cascade as it strives to meet the internal energy demands of its rapidly growing economy as well as supplying energy for export to mainland Southeast Asia. As has been highlighted, there are serious *public* concerns in downstream riparian nations as to the consequences of the Lancang Cascade. Nevertheless, governments in the lower Mekong basin are not only buying energy from the Cascade, but are also heavily involved in the capture of the hydropower potential within their own borders. This section will focus on liberal institutionalism, considering why there is both an absence of conflict over hydropower development and why nations are developing

the Mekong River Basin at such a rapid pace without due consideration for the environmental consequences.

Asia, and in particular south-east Asia has a plethora of multilateral institutions. Prominent examples are the Association of Southeast Asian Nations (ASEAN), ASEAN Regional Forum (ARF), Asia Pacific Economic Cooperation (APEC), Asian Development Bank (ADB), Shanghai Cooperation Organisation (SCO), East Asia Summit (EAS) and South Asian Association for Regional Cooperation (SAARC).⁵²⁹ This section will focus on two institutions that are less well known, but nevertheless the most relevant to the Mekong River Basin: the Mekong River Commission (MRC) and the Greater Mekong Subregion (GMS).

The Mekong River Commission

The Mekong River Commission (MRC) was established in 1995 after the Lower Mekong riparians of Thailand, Laos, Cambodia and Vietnam signed the “Agreement on the Cooperation of the Sustainable Development of the Mekong River Basin” (more commonly known as the *Mekong Agreement*.)⁵³⁰ Although both China and Myanmar did not sign on to this agreement, they have subsequently been added as “dialogue partners”.⁵³¹

The *Mekong Agreement* set out ten principles of cooperation including: the protection of the environment and ecological balance of the basin; the reasonable and equitable utilisation of the river; and provisions for the maintenance of flows on the mainstream. Additionally, the *Mekong Agreement* included provisions for the prior consultation and timely notification of the proposed use of the Mekong’s water, discouraging the unilateral use of water by any single riparian. This has been broadened into the Procedures for Notification, Prior Consultation and Agreement process (PNPCA) which has recently been put to the test by the commencement of the construction of the Xayaburi Dam and the more recent initiation of the PNPCA

⁵²⁹ Goh, "Developing the Mekong," 11-12.

⁵³⁰ "Mekong Agreement". For more on the historical development of the MRC including the defunct Mekong Committee, see: Abigail Makim, "Resources for Security and Stability? The politics of regional cooperation on the Mekong, 1957-2001," *The Journal of Environment & Development* 11, no. 1 (2002).

⁵³¹ Donald E. Weatherbee, "Cooperation and Conflict in the Mekong River Basin," *Studies in Conflict and Terrorism* 20, no. 2 (2008).

process for the Don Sahong Dam – both projects being Mekong mainstream dams.⁵³²

From an institutionalist perspective, the MRC is frequently held up as an example of an institution that enables the facilitation and sharing of knowledge, the peaceful discussion of water related issues, and a general increase in peace and stability.⁵³³ Although the actual role and responsibilities of the MRC are vague – having evolved somewhat over the years – it currently sees itself as a body implementing the principles of Integrated Water and Related Resources Management.⁵³⁴ In doing this, the MRC is able to provide a regional and transboundary perspective on development activities within the basin. In keeping with this role, in the last few years the MRC has produced the IWRM Basin Development Strategy (BDS) and the Strategic Environmental Assessment of Mainstream Dams (SEA), both contributing significantly to the understanding of the impacts of hydropower development in the region.⁵³⁵ The MRC's vision is to facilitate "(a)n economically prosperous, socially just and environmentally sound Mekong River Basin"⁵³⁶ and although this is no doubt a laudable goal, there are serious questions as to whether the MRC is able to influence actors and events to the extent that would enable it to achieve this.

Although the MRC is held up as a body that is able to mitigate conflict and resolve water related disputes on the Mekong, closer inspection shows that it is "a rather toothless organization"⁵³⁷, an institution with virtually no power, unable to enforce or regulate IWRM issues and without the authority to resolve or adjudicate disputes

⁵³² Shannon Lawrence, "Power Surge: The Impacts of Rapid Dam Development in Laos," (Berkeley: International Rivers, 2008); Lee and Scurrah, "Power and Responsibility", 18.

⁵³³ Makim, "Resources for security and stability?," 41; Susanne Schmeier, "Regional Cooperation Efforts in the Mekong River Basin: Mitigating river-related security threats and promoting regional development," *Austrian Journal of Southeast Asian Studies* 2, no. 2 (2009): 49; Gerdy Rees, "The Role of Power and Institutions in Hydrodiplomacy: Does Realism or Neo-Liberal Institutionalism offer a stronger theoretical basis for analysing inter-state cooperation over water security?" (University of London, 2010), 43; Jörn Dosch and Oliver Hensengerth, "Sub-Regional Cooperation in Southeast Asia: The Mekong Basin," *European Journal of East Asian Studies* 4, no. 2 (2005): 276; Toset, Gleditsch, and Hegre, "Shared Rivers and Interstate Conflict," 976.

⁵³⁴ Kuenzer et al., "Understanding the Impact of Hydropower," 580; Lee and Scurrah, "Power and Responsibility", 20. For an overview of the MRC's IWRM strategy see: M.R.C., "Basin Development Strategy".

⁵³⁵ M.R.C., "Basin Development Strategy"; "MRC Strategic Environmental Assessment (SEA) of Hydropower on the Mekong Mainstream - Summary of the Final Report," (Hanoi, Viet Nam: International Center for Environmental Management, 2010).

⁵³⁶ Sian Green, "Nam Theun II: A Laotian landmark," *Power Engineering International* 13, no. 8 (August 2005).

⁵³⁷ Schmeier, "Regional Cooperation Efforts," 46.

between signatories to the agreement.⁵³⁸ In a similar fashion to “the ASEAN way” the MRC facilitates multilateral discussion but discourages conflict, having no formal facilities for the resolution of disagreements about the use of the Mekong’s resources.⁵³⁹ The 1995 *Mekong Agreement* was not established as a rules-based institution because signatories were unwilling to surrender some sovereignty to a regional governance body.⁵⁴⁰ When differences of opinion occur, potential areas of conflict are lifted to the ministerial level and are dealt with bilaterally rather than within the MRC’s multilateral forum.⁵⁴¹ This inability to deal with potential conflict over the exploitation of the Mekong is a severely limiting factor for the MRC, especially given the potential for conflicting views over the Mekong’s use.

Additionally, given China’s upstream role in the capture and exploitation of the river in the upper reaches of the Mekong, and the deleterious impacts that have been outlined earlier in the chapter, China’s absence as a signatory calls into question the MRC’s ability to implement a holistic IWRM program.⁵⁴² Furthermore, the lack of attention paid to the MRC and its recommendations is frequently displayed in the approach of downstream riparians who act according to their own national prerogatives rather than what has been proposed by the MRC as best practice based on the most up-to-date scientific data and environmental knowledge.⁵⁴³

There is no better example of this than the twelve planned hydropower projects on the lower Mekong mainstream which would convert over fifty percent of the lower Mekong mainstream into reservoir, wiping out between 550,000 and 880,000 tonnes of fish annually and capturing a further fifty percent of the sediment load of the river.⁵⁴⁴ This would mean that in conjunction with the Lancang Cascade, the Mekong mainstream dams would capture a total of seventy-five percent of the total sediment of the river: a staggering 120 million tonnes of sediment withheld from the Delta

⁵³⁸ Lee and Scurrah, "Power and Responsibility", 20-21; Osbourne, "River Under Threat", 47-51.

⁵³⁹ Hensengerth, "Vietnam's Security Objectives," 109.

⁵⁴⁰ Kuenzer et al., "Understanding the Impact of Hydropower," 578; Buxton, Martin, and Kelly, "Conflict resolution," 31.

⁵⁴¹ Author interview, Mekong River Commission Representative, Vientiane, Lao PDR (October, 2011); Buxton, Martin, and Kelly, "Conflict resolution."

⁵⁴² Darrin Magee, "China Fails to Build Trust with Mekong Neighbours," *chinadialogue*, 24 August, 2013: <https://www.chinadialogue.net/article/show/single/en/6234-China-fails-to-build-trust-with-Mekong-neighbours>; Lee and Scurrah, "Power and Responsibility", 42.

⁵⁴³ Lee and Scurrah, "Power and Responsibility", 37; Hensengerth, "Vietnam's Security Objectives," 106,15.

⁵⁴⁴ "MRC SEA Summary", 14-15.

annually. Although proponents of the dams claim that the gains, in a best case scenario, could be up to US\$33 billion, the worst case scenario could mean basin-wide losses of over a US\$250 billion.⁵⁴⁵ The MRC commissioned SEA provided strong evidence demonstrating the risks of going ahead with these projects, nevertheless, Laos has moved ahead with its plans to dam the Mekong with construction already started on the Xayaburi Dam and the PNPCA process for the Don Sahong Dam currently under way. Although the Don Sahong Dam has the potential to destroy the long term viability of the Tonle Sap fisheries, the PNPCA process does not require consultation from downstream affected communities and does not enable other riparians to veto or influence the decision – raising questions as to the point of the process at all.⁵⁴⁶ The MRC's SEA recommendation that "(d)ecisions on mainstream dams should be deferred for a period of ten years"⁵⁴⁷ has clearly been ignored and the significant impacts – particularly of the Don Sahong Dam – have been discounted as important enough to warrant caution.

This means that the MRC is essentially an impotent institution, valuable perhaps as a source of knowledge but having no obvious or enforceable influence on policy or action. So, although the MRC officially desires an economically prosperous, socially just and environmentally sound Mekong River Basin, it appears that MRC signatories are pursuing only the first of these objectives: the rapid development and exploitation of the Mekong – especially in the area of hydropower development. This is against the recommendations of the MRC and, although it may be an institution that facilitates information sharing, it is far from an institution that formally engenders peace and security – especially if security is understood as the well-being and prosperity of those who live within the borders of a nation state rather than simply those who control it. To understand why the Mekong riparians are pursuing this singular focus, we need to switch our focus to another Mekong institution, the Greater Mekong Subregion.

⁵⁴⁵ Robert Costanza et al., "Planning Approaches for Water Resources Development in the Lower Mekong Basin," (Portland: Portland State University and Mae Fah Luang University, July 2011), 25; Baker, "Dams, Power and Security".

⁵⁴⁶ Lee and Scurrah, "Power and Responsibility", 41.

⁵⁴⁷ "MRC SEA Summary", 22.

The Greater Mekong Subregion

The Greater Mekong Subregion (GMS) was established in 1992 under the auspices of the Asian Development Bank (ADB) when Cambodia, China, Laos, Myanmar, Thailand and Vietnam all “entered into a program of subregional economic cooperation, designed to enhance economic relations among the countries”⁵⁴⁸. The GMS, with support from the ADB and other international donors, has implemented a program focused on projects related to “transport, energy, telecommunications, environment, human resource development, tourism, trade, private sector investment, and agriculture”⁵⁴⁹. The GMS is focused on the economic development, modernisation and industrialisation of the region with around US\$11 billion having already been spent on infrastructure projects since its inception in 1992.

The GMS is a far more cooperative institution both on paper and in terms of its achievements. The fact that all six riparian governments are members of the GMS means that it has a much more realistic chance of implementing successful subregional and transboundary projects, particularly related to energy and transport infrastructure. The US\$11 billion worth of projects already implemented is a clear sign of the effectiveness of the GMS program. Nevertheless, although the economic benefits of cooperation are potentially high, there are few costs associated with non-cooperation. Joint projects only require agreement between two states, with other countries not required or requested to give approval before moving forward.⁵⁵⁰

Furthermore, the broader costs to the environment and ecosystem services of the Mekong are rarely factored into GMS projects and frequently overlooked by planners and strategists. For example, the GMS’s energy strategy paper gives virtually no consideration to the negative impacts of hydropower development in the GMS, summarising the social impacts of hydropower into a single table displaying the negative social consequences as a small dollar figure per kilowatt hour.⁵⁵¹

Environmental considerations are sidelined from the main GMS program through the Core Environmental Program (CEP) which is responsible for environmental strategic

⁵⁴⁸ "Mortality Rate, Infant (per 1,000 live births)," *World Bank Group*, 2014: <http://data.worldbank.org/indicator/SP.DYN.IMRT.IN/countries/LA?display=default>. For a detailed overview of the activities of the GMS see: Goh, "Developing the Mekong," 27-33.

⁵⁴⁹ "Mortality Rate, Infant (per 1,000 live births)."

⁵⁵⁰ Schmeier, "Regional Cooperation Efforts," 48.

⁵⁵¹ "Building a Sustainable Energy Future – The Greater Mekong Subregion," (Manila: Asian Development Bank, 2009), 41-42.

planning, environmental monitoring, environmental safeguards, biodiversity and climate change.⁵⁵² Of relevance is the fact that the CEP is set apart from the GMS, with a separate website and headquarters.

The CEP is realistic about its potential efficacy as far as fulfilling its mandate. Getting GMS countries to shift from their short term focus of “grow first – clean up later”⁵⁵³ is viewed as an “immense challenge”⁵⁵⁴. This is due to “inadequate regulatory frameworks, a lack of technical know-how, fragmented government institutions and cross-sector coordination, and a lack of information on natural capital stocks and ecosystem services (which) are among the many issues that need to be addressed”⁵⁵⁵. It is worth noting that the CEP is, in some respects, tasked with a similar informational role as the MRC, yet there is no official cross institutional collaboration on these issues. As with the MRC, the CEP’s efficacy at influencing the policy of and projects carried out by GMS countries is highly questionable, given the continued rapid development that gives so little concern for the long-term and broader consequences of the projects.

Absent from both the GMS and its CEP is a centralised consideration of hydropower and its environmental or social consequences. Nor is water given separate consideration as a resource.⁵⁵⁶ Given the serious negative impacts of hydropower as outlined above, and the fact that the word ‘Mekong’ stands at the centre of the GMS, this appears to be a considerable oversight. Hydropower is seen as just one section of the energy mix in the GMS and given no special place in GMS strategies. The fact that hydropower is potentially worth US\$33 billion in the Mekong River Basin alone suggests that the lack of consideration of water and hydropower as a single issue appears to be more omission than oversight.

Sinha believes that this is in line with Chinese strategies of linking hydropower with economic growth rather than with social and environmental issues.⁵⁵⁷ Along similar

⁵⁵² "Greater Mekong Subregion - Core Environment Program," *Asian Development Bank*, 2014: <http://www.gms-eoc.org/>.

⁵⁵³ "Component Strategy: Environmental Planning, Safeguards, and Monitoring," (Manila: Asian Development Bank - Environment Operations Centre, March 2013).

⁵⁵⁴ "Strategic Planning: Greater Mekong Subregion - Core Environment Program," *Asian Development Bank*, 2014: <http://www.gms-eoc.org/>.

⁵⁵⁵ "Strategic Planning: ADB CEP."

⁵⁵⁶ Author interview, International Financial Institution Representative, Vientiane, Lao PDR (October, 2011);

⁵⁵⁷ Sinha, "Examining China's Hydro-Behaviour."

lines, Biba suggests that China's actions in relation to economic integration are a deliberate form of 'desecuritisation' – or the shifting of issues off the security agenda and into the 'normal' realm of politics.⁵⁵⁸ China's membership and strong participation in the GMS with its focus on economic issues, coupled with its non-membership of the MRC which focuses on the MRB as a complex hydrological ecosystem that supports the livelihoods of millions of people, also supports this point of view. It would also help to explain why the CEP, even with its focus on the environment, is unable to discuss water issues as a discrete subject: its priorities are obviously guided by its member states.

What is clear is that economic development in the MRB is facilitated by the GMS and that cooperation surrounding infrastructure, industrialisation and economic growth is generally high as a result. This is linked with ASEAN's "strong economic development imperative, and a conviction that economic growth is a critical means of ensuring regime legitimacy and security"⁵⁵⁹. What is also clear is that this cooperation comes at the cost of viewing the environment as a servant to this economic development: "Forests, land, and water resources and the ecosystem services they provide are a major driver of economic development in the GMS"⁵⁶⁰. Far from seeing the Mekong River Basin as an interconnected ecological unit, the GMS encourages nation states to take a state-based view of the Mekong as far as the environment is concerned, remaining wilfully ignorant of the transboundary impacts of infrastructure projects.⁵⁶¹ Ironically, this ecological fragmentation occurs in the context of developing subregional economic collaboration and integration.

Conclusion

This first case study chapter has focused on macro considerations of security issues surrounding the construction of the Lancang Cascade. It has three main achievements. Firstly, it demonstrates clearly that the Lancang Cascade has significant environmental impacts both in close proximity to the dams and as far

⁵⁵⁸ Sebastian Biba, "Desecuritization in China's Behavior Towards its Transboundary Rivers: the Mekong River, the Brahmaputra River, and the Irtysh and Ili Rivers," *Journal of Contemporary China* 23, no. 85 (2014).

⁵⁵⁹ Goh, "Developing the Mekong," 12.

⁵⁶⁰ "Environmental Monitoring: Greater Mekong Subregion - Core Environment Program," *Asian Development Bank*, 2014: <http://www.gms-eoc.org/Environmental-Monitoring>.

⁵⁶¹ Dosch and Hensengerth, "Sub-Regional Cooperation in SE Asia."

away as the Mekong delta. This impacts on the environmental services of the river and therefore on the people.

Secondly, it demonstrates that although a realist perspective may expect hostility to occur between China and its downstream riparians due to China's inequitable capture of the resources of the Mekong, conflict is in fact not occurring. Instead, the LMB riparians are exploiting, or seeking to exploit the hydropower potential in their own sections of the river as well as actually purchasing electricity generated by the Cascade. This only exacerbates the ecological and social problems caused by the Lancang Cascade and thus the decision to move forward with LMB mainstream dams threatens an ecological and social catastrophe on a scale which is difficult to measure.

The final achievement of the chapter has been to explore the mentality behind the rapid and careless hydropower construction in the MRB. Quite clearly the economic and development prerogative override virtually all other considerations. Nowhere is this more clearly demonstrated than through the development priorities set by the ADB's GMS, which give little to no consideration to environmental and social issues. The security theory of liberal institutionalism supports this singular focus on development and economic growth, suggesting that the more integrated nations become through multilateral cooperation and economic integration, the more likely they are to avoid armed conflict given the costs involved.⁵⁶²

Unfortunately, in the case of the MRB, although there is much to gain from cooperation at a certain level, the costs of non-cooperation are negligible. This kind of attitude is made clear in the decision of Laos to move ahead with the construction of two Mekong mainstream hydropower projects against all reputable scientific advice and the clear recommendations from the MRC requisitioned SEA. The MRC's PNPCA requirements are so unrestrictive that although prior notification is required under the *Mekong Agreement*, fellow signatories have no recourse or even mechanism to dispute the decision. This effectively makes the MRC a largely irrelevant and impotent institution with little, if any, impact on the policy decisions of MRB riparians. Even GMS projects only need agreement between two of the signatories to move forward with a project (such as the Xayaburi) with no recourse or

⁵⁶² Goh, "Developing the Mekong," 16.

conflict resolution mechanism available. This is not so much peaceful liberal institutional behaviour as it is a Wild West ‘first in – first served’ attitude to resources with a blatant disregard for the lives of those who are affected by hydropower development.⁵⁶³

What this all demonstrates is that although hydropower construction in the MRB is clearly having an impact on the ecological integrity and ecosystem services of the region, threatening to devastate the livelihoods and subsistence of millions of the Mekong’s residents, as far as the traditional security theories of realism and liberal institutionalism are concerned, there is no security issue. This is not to suggest that realists or liberal institutionalists are necessarily callous or unsympathetic to the plight of those affected by hydropower construction on the Mekong and its tributaries, but merely that these traditional theories are unable to grasp and deal with the complexity arising from an ecological system where regional, national and sub-national interests interplay in complex and evolving ways. Both theories place states as the primary actors and the referent object of security: realism emphasising the anarchic international system and the operation of power, and liberal institutionalism focusing on the way that institutions can encourage normative behaviour and moderate anarchy. Totally absent from this discourse is the plight of those impacted by ongoing hydropower development.

It would be foolish to ‘throw out the baby with the bathwater’ so to speak, by suggesting that an understanding of states and institutions is not required or important in the context of hydropower in the Mekong River Basin. The sections above clearly indicate that states and institutions are both part of the problem and potential solutions to the complex challenges of balancing development and environment. But the generally macro, or state/international, approach of both realism and liberal institutionalism fail to grasp the micro level problems that are occurring at the level of the community and individual as a result of hydropower. There may be no conflict between states, and this may be partially attributable to the growing economic cooperation due to institutional linkages in the region, but this gives no insight into the suffering and deprivation that is occurring as a result of hydropower development. Clearly a more nuanced and specific understanding of the

⁵⁶³ Author interview, International Development Agency Representative, Bangkok, Thailand (September, 2011);

consequences of hydropower in the MRB is needed in order to gain clarity on the potential environmental security implications of these activities. The next chapter will attempt to understand the micro level issues that are resulting from hydropower construction by focusing on a single hydropower project, the Nam Theun 2 Dam in central Laos.

Chapter Five: The Nam Theun 2 Dam – Human Security Perspectives

Thinking in terms of human security shifts the scale of analysis away from nations to the local level. It focuses on the immediate vulnerability of most of the world's population, as opposed to hypothetical threats to nation-states. It provides a referent object which, when combined with environmental concerns, forms the basis for a new approach to environmental security.

Jon Barnett: The Meaning of Environmental Security.⁵⁶⁴

Introduction

This chapter narrows the focus of analysis from the macro, which considered the Lancang Cascade and mainstream dams and their impact on the Mekong River Basin (MRB) as a whole, to a micro perspective – encompassing only one dam and its much more localised impacts.⁵⁶⁵ This is necessary in order to understand the way that hydropower in the MRB impacts at the level of human security – the other key element for environmental security studies. The chapter is structured to initially provide an outline of the national, Laotian context of the Nam Theun 2 Dam (NT2). It then overviews the project itself, providing a summary of the relevant technical aspects of the dam. As with all dams, there are upstream and downstream issues, and the chapter will divide its attention between each of these. Above the dam, the most significant impacts have been created by the infilling of the NT2 reservoir behind the dam wall, inundating villages, rice cropping areas and grazing area for buffalo, forcing the relocation of thousands of villagers. Downstream, the impacts have mostly been felt around the Xe Bang River, known locally as Xe Bang Fai (XBF). These are qualitatively similar to those that have been caused by the Lancang Cascade and other dams, such as irregular water flows, increased flooding,

⁵⁶⁴ Barnett, *The Meaning of Environmental Security*.

⁵⁶⁵ Micro is a relative word of course, and from a biological perspective could refer to a single organism. However, studying a single dam and its impacts on local ecosystems, communities and individuals is certainly a micro perspective in the context of the entire MRB, broader Asia, the global environment and the perspective of international security studies.

sediment capture, erosion and impacts on food and water supply. Following the details of the environmental and social impacts of the NT2, consideration will be given to the security implications, taking into account the dearth of security discourse on the issue. Particular attention will be paid to the human security implications of the NT2.

A brief justification is needed here as to the reasoning behind the choice to use the NT2 as the micro component of this thesis. It could be argued, for example, that given the focus of the previous chapter on the Chinese dams, the localised impacts of the Lancang Cascade should be studied. Unfortunately, the paucity of data on the livelihood impacts of these dams at the local level in Yunnan Province and difficulties surrounding access, prevents such an examination (any refs for this?). Additionally, the very high dams and relatively small population affected means that the impacts in the vicinity of the Chinese dams is qualitatively and quantitatively different to those that will affect the millions who live in the Mekong Delta or Tonle Sap. A related argument could also be made that, given that the main impacts of the Lancang Cascade are being felt on the mainstream and further downstream – particularly in the Delta or Tonle Sap, the micro focus should be on these areas. This, however, would defeat the purpose of a micro analysis, and would also result in the specificity of this chapter being lost. Indeed, even a micro study of the hydrological impacts in either of these areas, for example examining a single village or town in the Delta or Tonle Sap, would still present significant difficulties in identifying the role of the Lancang Cascade. This is due to the role that human activity is already having in these areas through activities such as overfishing, water extraction, sand dredging, channel diversion and other non-Lancang Cascade induced changes – as briefly discussed in the previous chapter.

On the other hand, the case of the NT2 presents a unique opportunity to examine the impacts on human security brought about by the environmental changes caused by a large dam, without the influence of other significant anthropogenic processes.⁵⁶⁶ Before the flooding of the Nakai Plateau by the NT2's reservoir and the significant impacts downstream on the XBF – both the Nakai Plateau and the XBF basin were fundamentally agricultural regions, with little industrialisation, virtually no

⁵⁶⁶ The exceptions being climate change and unexploded ordnance from the American/Vietnam war.

groundwater extraction, using agricultural techniques and pursuing livelihood options that had been in place for centuries.⁵⁶⁷ This means that the changes to the security and livelihoods of those in this region following the construction and subsequent operation of the NT2 can be much more easily attributed to hydropower than any study that may take place in the Tonle Sap or Delta. Furthermore, the richness of the data surrounding the construction and operation of the NT2 provides fertile ground for an investigation into the human security aspects of dams. This specific context is crucial, given this thesis is investigating Systemic Environmental Security and that human security aspects are an important piece of the puzzle.

Section One: The Nam Theun 2, Ecological Destruction and Livelihood Losses

The Laotian Context

The main contribution of political ecology to environmental security is to encourage an approach that gives more direct attention to a phenomenon's specific temporal and spatial context. With this in mind, a brief overview of the context of the construction and operation of the NT2 is provided here. The NT2 is just one project within the massive drive for hydropower in the Mekong River Basin (MRB) as discussed in the previous chapter. More specifically, it has been built as part of the Laotian Government's (GoL) desire to become the 'battery of Southeast Asia' or 'Southeast Asia's Kuwait'.⁵⁶⁸ The GoL intends to capture as much of the vast hydropower potential (18-20,000 MW) within its borders as it can, so as to provide energy to its own people but, more importantly, to export the energy within the region in order to build up its reserves of foreign income.⁵⁶⁹ As of 2013 there were 16 hydropower projects operational in Laos, with another 14 under construction, 24 in the planning (Project Development Agreement) stage and a further 32 in the feasibility (Memorandum of Understanding) stage.⁵⁷⁰

⁵⁶⁷ Bruce Perry Shoemaker, Ian G Baird, and Monsiri Baird, *The People and Their River: A survey of river-based livelihoods in the Xe Bang Fai river basin in Central Lao PDR* (Vientiane: Lao PDR/Canada Fund for Local Initiatives, 2001).

⁵⁶⁸ Weatherbee, "Cooperation and Conflict."

⁵⁶⁹ Green, "Nam Theun II: A Laotian landmark."; Jeffrey W. Jacobs, "Planning for Change and Sustainability in Water Development in Lao PDR and the Mekong River Basin," *Natural Resources Forum* 20, no. 3 (1996): 179; Lawrence, "Power Surge", 13-17.

⁵⁷⁰ "Electric Power Plants in Laos," *Ministry of Energy and Mines - Department of Energy Business*, 2013: www.poweringprogress.org/index.php?option=com_jotloader&task=files.download&cid=444.

Economic development is of crucial relevance to Laos given that it is landlocked, one of the world's least developed countries (LDCs), and relies heavily on foreign aid for much of its development. Years of warfare against the Thais in the 17th and 18th centuries, French colonisation in the 19th century, and the Indochinese wars of the 20th century, have left the country impoverished and covered in unexploded ordnance (UXO).⁵⁷¹ During the American/Vietnam war two million tonnes of ordnance was dropped on Laos in an attempt to interdict North Vietnamese troops and equipment travelling through Laos and down the Ho Chi Minh Trail. Up to a third of these did not explode and remain in the fields and forests of Laos creating serious health risks and development challenges.⁵⁷² The U.S. bombing of Laos was also an attempt to support Royal forces against the communist Pathet Lao who went on to take over control of the country in 1975. A decade or more of poor economic decisions combined with the legacies of war meant that Laos' LDC status was firmly entrenched.

Throughout the 1990s, a series of decisions to move towards regional integration and economic reform led to a normalisation of trade relations with the U.S. and others throughout the 2000s, including finance for the NT2 project from both the World Bank and the Asian Development Bank (ADB).⁵⁷³ On the back of the rapid investment in the hydropower and mining sectors, Laos has witnessed annual economic growth of over 7% since 2005, seeing its GDP per capita grow from US\$472 in 2005, to just over \$US1,645 in 2013.⁵⁷⁴ Hydropower is an important part of the GoL's plans to continue this growth and 'graduate' from the list of LDCs – a goal it has set itself to achieve by 2020.⁵⁷⁵

This growth is uneven, however, given that an increasing number of households are involved in agricultural production, yet agriculture is playing a diminishing role in the

⁵⁷¹ Grant Evans, *A Short History of Laos: The Land in Between* (Sydney: Allen and Unwin, 2002); Martin Stuart-Fox, *A History of Laos* (Melbourne: Cambridge University Press, 1997).

⁵⁷² "Secret War in Laos," *Legacies of War*, 2014: <http://legaciesofwar.org/about-laos/secret-war-laos/>.

⁵⁷³ "Laos Profile - Timeline," *BBC* 2014: <http://www.bbc.com/news/world-asia-pacific-15355605>.

⁵⁷⁴ "Laos GDP Per Capita (current US\$)," *World Bank*, 2014: <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD/countries/LA?display=graph>.

⁵⁷⁵ "Laos: Aiming to leave least developed country list," *IRIN: Humanitarian news and analysis*, 17 May, 2012: <http://www.irinnews.org/report/95470/laos-aiming-to-leave-least-developed-country-list>.

Lao economy, reducing from 53% of GDP in 1996 to 28% in 2013,⁵⁷⁶ Given that 77% of all households in Laos continue to earn their living from agricultural production, and that the number of households involved in agriculture is on the increase, it is clear that economic growth is being led by the industry and services sectors.⁵⁷⁷ This further indicates the uneven distribution of the benefits of Laos's rapid economy growth. GoL official statistics support this. For example, even with the rapid growth in energy production, only 48% of rural villages are connected to the electricity grid and only 39% have a safe water supply. Just 2% of rural households have access to irrigation pumps or veterinary services. Food security is a serious concern with between 44 - 50% of all children under five years of age being stunted as a result of a poor diet; 31% are underweight.⁵⁷⁸ Lack of health services and poor nutrition has led to persistently high infant mortality rates.⁵⁷⁹ One of the most common arguments in support of the rapid hydropower development in Laos is that it will increase the foreign currency reserves of the GoL and this can then be used for poverty alleviation.

There are serious concerns surrounding Laos' relatively rapid economic growth due to the observed corruption throughout the government and its institutions. Laos ranks 140th of 177 countries on Transparency International's *Corruption Perception Index* for 2013 and 165th of 179 in the *Press Freedom Index*.⁵⁸⁰ There is a great deal of evidence in regards to corrupt land and industry deals that put government members' family interests above the nation and its citizens.⁵⁸¹ On top of this, those

⁵⁷⁶ "Laos - Nam Theun 2 (NT2) Hydroelectric Project : Update," (Washington DC: World Bank Group, July 21, 2008), A6; "Statistical Yearbook 2011," (Vientiane: Lao Statistics Bureau: Ministry of Planning and Investment, August 2012), 28-32.

⁵⁷⁷ "Lao Census of Agriculture 2010/11 Highlights," (Vientiane: Department of Planning, Ministry of Agriculture and Forestry - Agricultural Census Office, May, 2012), ix.

⁵⁷⁸ "Lao PDR Nutrition Factsheet," *World Food Programme*, August 2014: <https://www.wfp.org/countries/lao-pdr/publication/nutrition-factsheet>; "Laos: Full Country Visit Report," *Coordination Team of the UN System High-Level Task Force on the Global Food Security Crisis (HLTF)*, 2009: un-foodsecurity.org/sites/default/files/Laos_Sept09.pdf.

⁵⁷⁹ "Mortality Rate, Infant (per 1,000 live births)."

⁵⁸⁰ "Corruption by Country: Laos," *Transparency International*, 2014: <http://www.transparency.org/country#LAO>.

⁵⁸¹ See for example: "Mystery Surrounds Death of Key Laos Officials," *Crikey*, June 10, 2014: <http://www.crikey.com.au/2014/06/10/mystery-surrounds-death-of-key-laos-officials/>; Melinda Boh, "A Dam Too Far in Laos," *Asia Times Online Ltd.*, April 12, 2013: http://www.atimes.com/atimes/Southeast_Asia/SEA-01-120413.html; Martin Stuart-Fox, "Family Problems," *Inside Story*, 19 January, 2011: <http://insidestory.org.au/family-problems/>.

who stand up against government corruption are frequently ‘disappeared’.⁵⁸² The concern is that, given the GoL’s poor transparency and levels of corruption, the economic and social benefits of Laos’ rapid economic growth are unlikely to be distributed evenly.

The above overview helps to provide a better understanding of the national context of the decision to construct the NT2 dam. The legacies of war, underdevelopment, rapid but inequitable economic growth, a single party government beset by corruption, and assistance from international financial institutions have all played a role in the decision to construct the NT2, but also continue to play a role in the political and social context of its operation. The next section will overview the NT2 project itself.

Overview of the Nam Theun 2 Dam

The NT2 is one of the most studied hydropower projects in the world. This is because it is considered to be a ‘best practice’ or ‘model’ dam, with funding from a total of 27 different parties, including both the World Bank and the Asian Development Bank.⁵⁸³ The developer for the US\$1.45 billion project is the Nam Theun 2 Power Company (NTPC), which includes a conglomeration of Electricité de France Internationale (35%), the Electricity Generating Company of Thailand (EGAT) (25%), Italian – Thai Development Company (15%) and the GoL (25%).⁵⁸⁴ Argued to be “the most complex public-private partnerships in the history of dam development”⁵⁸⁵, the NT2 has been constructed as a build, own, operate, transfer (BOOT) project with a concession period of 25 years, following which, the NTPC must hand complete control of the dam over to the GoL. Of a total of 1,070 MW generated by the project, 95% is exported to Thailand and the remainder is fed into

⁵⁸² Author interview, Local Non-Government Organisation Representative, Vientiane, Lao PDR (October, 2011). Also see: Shalmali Guttal and Josie Cohen, "Break the Silence on Advocate’s Disappearance," *Today: Media Corp.*, October 9, 2013: <http://www.todayonline.com/singapore/break-silence-advocates-disappearance?singlepage=true>.

⁵⁸³ According the ADB: “The Project has been designed to be a model for large hydropower projects”. See: "Lao People’s Democratic Republic: Greater Mekong Subregion Nam Theun 2 Hydroelectric Project – Social Safeguards Monitoring," in *Technical Assistance Report* (Manila: Asian Development Bank, June 2008), 1. See also: Ian C. Porter and Jayasankar Shivakumar, "Doing a Dam Better: The Lao PDR and the Story of the Nam Theun 2," (Vientiane: World Bank Group, 2011).

⁵⁸⁴ Shannon Lawrence, "Nam Theun 2: Trip Report and Project Update," (Berkeley: International Rivers, February 2008). 20.

⁵⁸⁵ Vincent Merme, Rhodante Ahlers, and Joyeeta Gupta, "Private Equity, Public Affair: Hydropower financing in the Mekong Basin," *Global Environmental Change* 24(2014): 22.

the local grid.⁵⁸⁶ It is expected that the GoL will earn a total of around US \$2 billion over the concession period, or on average US \$80 million per year.⁵⁸⁷

In regards to the dam itself, the relatively modest 39m high dam wall blocks the Nam Theun River on the Nakai Plateau. Impoundment of the river began in April 2008 and hydropower operations began in March, 2010. Rather than place the hydropower generators at the site of the dam – as is usual for most hydropower dams – the NT2 project captures 93% of the flow of the Nam Theun River – estimated at 7,000 million cubic metres annually (7 km³)⁵⁸⁸ – impounding it in the 450 km² reservoir, and diverting it down a 350m vertical surge shaft, into the power station below (see figure 14).

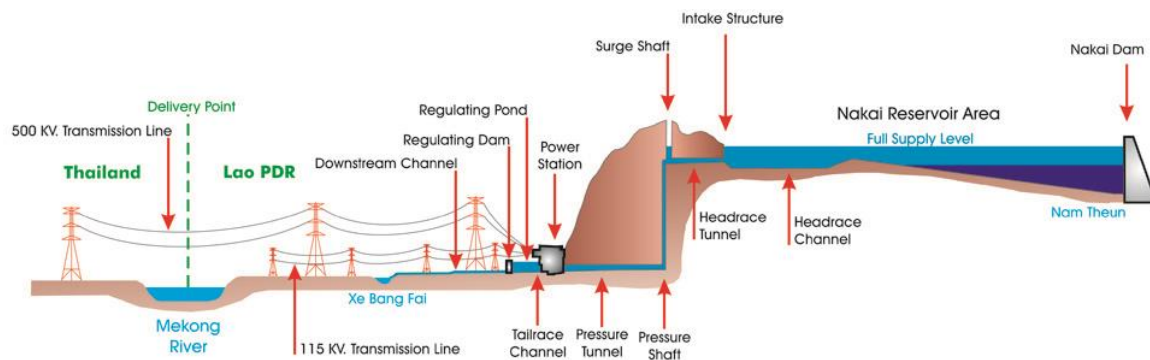


Figure 14: Schematic of the NT2 Hydropower Project

This increases the energy potential immensely but results in the majority of the Nam Theun River's flow being diverted into the Xe Bang Fai (XBF), a major Mekong tributary, after transferring the discharged water along a 27km manmade 'downstream channel'.⁵⁸⁹ This has serious consequences for both the Nam Theun River, which subsequently receives only a very small portion of its original flow, and the XBF, which now acts as a conduit for the majority of the waters of both the Nam Theun River (via the hydropower pump station) and its own natural flow.

⁵⁸⁶ Merme, Ahlers, and Gupta, "Private equity, public affair," 22.

⁵⁸⁷ "Project Overview and Description," *The World Bank Group*, September, 2010:

<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/LAOPRDEXTN/0,,contentMDK:21109109~pagePK:141137~piPK:141127~theSitePK:293684,00.html>.

⁵⁸⁸ Benoit Laplante, "Economic Analysis of the Environmental and Social Impacts of the Nam Theun 2 Hydroelectricity Power Project," (Washington, DC: World Bank, February, 2005), 78.

⁵⁸⁹ Peter Willing and Karla Knoop, "Review of Hydrology Component Of Environmental Assessment and Management Plan (EAMP) for Proposed Nam Theun 2 Hydropower Project Lao People's Democratic Republic," (Berkeley: International Rivers, January 20, 2005).

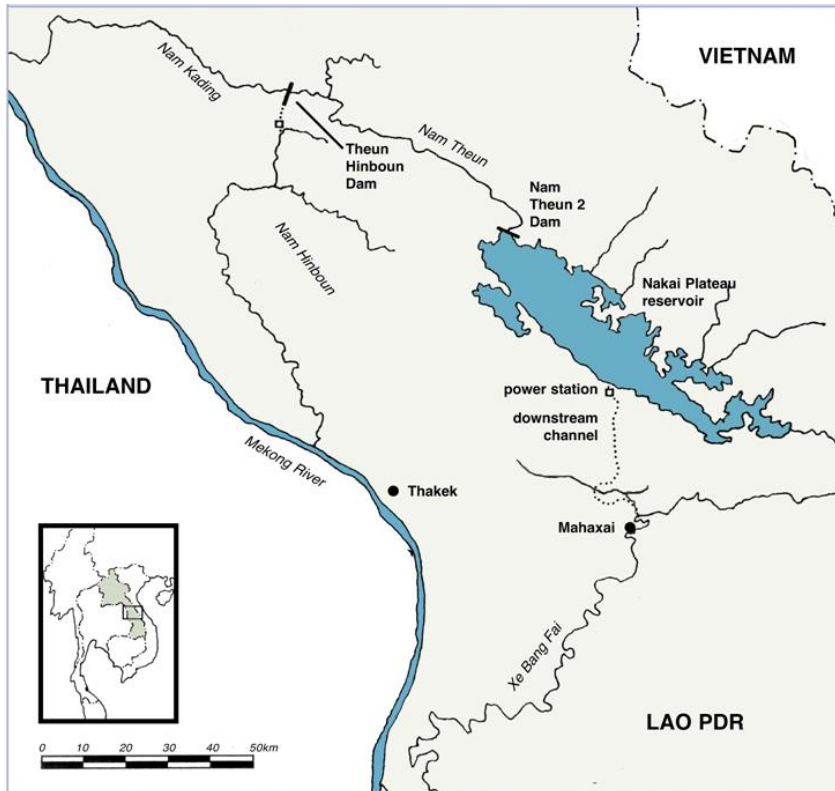


Figure 15: Map of NT2 Hydropower Project and XBF

One of the more unique aspects of the project, and in many respects an important source of evidence in regards to the impact on livelihoods of the NT2, is the built-in compensation and oversight for relocated villagers on the Nakai Plateau and for those living on and around the XBF, downstream from the reservoir. Both the World and the Asian Development Bank's support and funding of the project are based on "ensuring that social and environmental impacts of the project are addressed through a detailed program of mitigation, compensation and offset measures"⁵⁹⁰. An international Panel of Experts (PoE) was appointed to provide oversight of the social and environmental mitigation efforts, and their frequent reports provide excellent insights and evidence of the impacts of the NT2.

At least 6,200 Laotians on the Nakai Plateau have been relocated to make way for the reservoir, with another 10,000 impacted by the 27km channel from the power station to the XBF (picture of the channel?) and the new electricity lines that have been put in place to supply power to Thailand. Downstream on the XBF, another 120,000 villagers have been impacted by the significant changes brought about by

⁵⁹⁰ "Technical Assistance to the Lao People's Democratic Republic for Preparing the Greater Mekong Subregion: Nam Theun 2 Hydropower Development Project " (Manila: Asian Development Bank, November 2003), 2.

the dam. As will become evident, the impacts from the NT2 are similar to those of other hydropower projects in that there is an immediate impact in the area surrounding the dam and the reservoir, but also a downstream impact from the hydrological changes to the river. As with the Lancang Cascade, the downstream changes impact on a larger population who must attempt to adapt. The following sections will look first at the more localised changes on the Nakai Plateau as a result of the reservoir, followed by an examination of the way the XBF has been affected by the significant alterations to its flow.

The Nakai Plateau

The main driver of environmental change and insecurity on the Nakai Plateau is the 450km² reservoir that has flooded a large part of the plateau. According to the NTPC, 1,310 families, 6,289 persons, from 17 villages were removed from their traditional lands and resettled in 15 different areas.⁵⁹¹ Resettlers were provided with new houses – including sanitation, rainwater tanks and connection to the electricity grid – in addition to the construction of new wells, roads, schools, community meeting halls and health centres. Each family was compensated with 0.66 hectares of agricultural land which was cleared of UXO. Although obviously a significant disruption to their lives, generally speaking, resettlement led to an immediate improvement in living conditions. Without fail, villagers interviewed on the Nakai Plateau pointed to superior quality housing, connection to the electricity grid, improved sanitation and better access to water as evidence that their living conditions had improved from their traditional villages.⁵⁹² The NTPC and World Bank understandably point to the improvement in living conditions on the Nakai Plateau as evidence that hydropower projects need not bring with it negative outcomes for resettlers.⁵⁹³ In regards to living conditions, this is clearly true of the NT2.

What is much less clear is the sustainability of these living conditions and the prospect for resettlers of long term improvements in livelihoods options. Such a significant change to the local environment brought about by the blocking of the river and the infilling of the reservoir has had a profound impact on their livelihood options. Prior to the construction of the NT2, residents of the Nakai Plateau lived in relative

⁵⁹¹ NTPC – “Resettlement on Nakai Plateau: Infrastructure”

⁵⁹² Author interview, Villager: Villages 8 and 9, Nakai Plateau, Khammouane Province, Lao PDR (October 2011).

⁵⁹³ "Project Overview and Description."; NTPC, "Nakai Resettlers' Reality: From the Past to the Future," (Nam Theun 2 Power Company, August, 2014).

accord with their local environment which provided them with both the means of subsistence and 'employment'. Villagers were able to provide for their own food security through traditional agricultural practices such as rain fed rice cropping, raising of livestock such as buffalo and chicken, and catching a variety of fish species from the river. It is important that life before the NT2 and reservoir on the Nakai Plateau is not romanticised.⁵⁹⁴ Villagers are adamant that living conditions are better now; nevertheless it is important to keep in mind that their previous lifestyle was self-sustaining – the local environment provided them with sustainable, if poor, livelihoods.

In recognition of the role that the local ecosystem plays in the livelihoods of Nakai Plateau residents, the World Bank and ADB established a program designed to ensure the sustainability of the “five livelihood pillars”: agriculture, fisheries, forestry, livestock and off-farm employment.⁵⁹⁵ From an environmental security and renewable resource perspective, the first four pillars are of particular interest and will be discussed below.

Livestock

The raising of livestock is an important part of the livelihood mix in Laos.⁵⁹⁶ Owning buffalo in particular is considered a way of storing wealth, as buffalo can be sold in times of need in order to purchase essentials such as rice. On the Nakai Plateau this is also a normal practice.⁵⁹⁷ The great change in the local environment brought about by the infilling of the 450km² reservoir resulted in a large proportion of the grazing land on the plateau being inundated. This meant that 50% of the buffalo on the plateau had to be sold or culled before the reservoir was full. Due to the fact that so much stock needed to be sold simultaneously, the price plummeted and as a consequence, many villagers lost a large part of their 'savings' in the process.⁵⁹⁸ Many other buffalo that were not able to be sold became emaciated or starved to death.

⁵⁹⁴ NTPC, "Nakai Resettlers' Reality".

⁵⁹⁵ "Update on the Lao People's Democratic Republic Nam Theun 2 Hydroelectric Project," (Washington, D.C.: The World Bank Group, July 21, 2008), 6.

⁵⁹⁶ Brad Collis, "Shifting the Goals: Livestock for a Livelihood in Laos," *Partners Magazine* September 2004.

"Nam Theun 2 Annual Update: Project Progress During 2013," (Washington, DC: World Bank Group, 2013), 16.

⁵⁹⁷ NTPC, "Nakai Resettlers' Reality", 24.

⁵⁹⁸ David McDowell, Thayer Scudder, and Lee M. Talbot, "Fifteenth Report of the International Environmental Panel of Experts," (Manila: Asian Development Bank, 30 April 2009), 30.

As an alternative, resettlers were encouraged to experiment with poultry, pigs and cows, often borrowing money to do so. Due to a lack of technical knowledge and vocational training, these experiments have often failed and villagers have been left with a debt but with little ability to repay it.⁵⁹⁹ Nevertheless, the mix of livestock on the plateau is diversifying with up to 50% of resettlers now owning poultry and 15% owning pigs.⁶⁰⁰ The POE reports large numbers of dead and sick buffalo and cattle due to disease, and have made strong recommendations that a round of vaccinations be implemented across the plateau. This had not been implemented by mid-2014 and it is unknown whether the livestock pillar will be sustainable in the long run.⁶⁰¹

Agriculture

Most residents of the Nakai Plateau are subsistence farmers and fishers and the NTPC was mandated to provide compensation for land as well as training and assistance in other livelihood options.⁶⁰² Although each household has been compensated, there have been a range of issues that have arisen surrounding the adequacy of this land. The most important of these are, firstly, the amount of land given as compensation, secondly, the quality of the land for agriculture, and finally, the proximity of that land to villages.

The amount of land distributed as compensation for the loss of their traditional farms inundated by the reservoir was 0.66 hectares, and this amount was equal for all families. While 0.66 hectares is considered sufficient for a family of four, for larger families this amount is not adequate to produce enough rice.⁶⁰³ Additionally, residents are concerned about what they are to do when their children marry and how they should divide their allocated land. This issue is referred to by the

⁵⁹⁹ David McDowell, Thayer Scudder, and Lee M. Talbot, "Seventeenth Report of the International Environmental Panel of Experts," (Manila: Asian Development Bank, 22 November 2010), 11.

⁶⁰⁰ Silinthone Sacklokham, Phimthong Kouangpalath, and Chitpasong Kouonsavath, "Case Study: Compensation and Livelihood Restoration at Nam Theun 2 Hydropower Project," (Vientiane: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH February, 2014), 79-80.

⁶⁰¹ See: David McDowell, Thayer Scudder, and Lee M. Talbot, "Reports 21A and 21B of the International Environmental Panel of Experts," (Manila: Asian Development Bank, 12 March 2013), B21; David McDowell, Thayer Scudder, and Lee M. Talbot, "Twenty Second Report of the International Environmental Panel of Experts," (Manila: Asian Development Bank, 8 May 2014), 15-16.

⁶⁰² See: NTPC, "Nakai Resettlers' Reality".

⁶⁰³ Author interview, Village Elder: Village 8, Nakai Plateau, Khammouane Province, Lao PDR (October 2011).

international panel of experts (POE) as the “second generation problem”⁶⁰⁴. As children of resettlers grow-up and marry, the apportioned plots of land must either be broken into ever smaller plots, new land provided, or off-farm opportunities created. Previously, new couples were able to move to land close to their own village, land that is now submerged under the NT2’s reservoir. The GoL and the NTPC have consistently obfuscated on this issue and progress has been slow.⁶⁰⁵ This continues to be a significant challenge to the long-term sustainability of life on the Nakai Plateau and the more time progresses, the deeper the issue becomes. The POE report delivered in late 2013, for example, discovered an increasing trend of houses of second generation families without latrines or water, and an increasing number of widows or female divorcees in vulnerable situations in regards to their access to land.⁶⁰⁶

The quality of the compensated land is also important. One of the most significant issues for those who are relocated because of dams is that the reservoir floods the most productive and fertile land close to the river. On the Nakai Plateau, the quality of the reallocated land varies with some productive and others in unproductive rocky upland slopes. One village elder interviewed explained that the land he was given was so rocky it was too difficult to grow rice on. He provided for himself by fishing instead, and selling the fish to buy rice.⁶⁰⁷ This is a familiar story across the plateau. The POE reports that the majority of compensated land is “of poor quality and on erodible slopes”⁶⁰⁸. The problem is exacerbated by the fact that villagers are used to a swidden style of agriculture that leaves fields fallow for long periods of time between crops. The limited amount of land compensated means that land must now be used annually, without fallow time. Due to a combination of poor soil, inappropriate agricultural techniques, inadequate irrigation, and a lack of vocational

⁶⁰⁴ David McDowell, Thayer Scudder, and Lee M. Talbot, "Sixteenth Report of the International Environmental Panel of Experts," (Manila: Asian Development Bank, 25 February 2010), 29.

⁶⁰⁵ McDowell, Scudder, and Talbot, "16th PoE Report", 29; David McDowell, Thayer Scudder, and Lee M. Talbot, "Reports 18A and 18B of the International Environmental Panel of Experts," (Manila: Asian Development Bank, 12 February and 15 July, 2011), 22; David McDowell, Thayer Scudder, and Lee M. Talbot, "Nineteenth Report of the International Environmental Panel of Experts," (Manila: Asian Development Bank, 20 March 2012), 13, 36.

⁶⁰⁶ McDowell, Scudder, and Talbot, "22nd PoE Report", 26.

⁶⁰⁷ Author interview, Villager: Village 8, Nakai Plateau, Khammouane Province, Lao PDR (October 2011).

⁶⁰⁸ McDowell, Scudder, and Talbot, "21A and 21B PoE Report", 16.

training, the sustainability of agricultural production on compensated lands is dubious.⁶⁰⁹

Additionally, the remote location can also be a challenge. Some villagers must travel several hours in order to access suitable land for farming.⁶¹⁰ One affected family explained that their compensated plot of land was so far from their home that, because of the petrol bill involved to access it, it was more cost effective to let their plot sit fallow and put the money that would otherwise be used for the petrol bill into the purchasing of rice.⁶¹¹ This changed their livelihood options significantly, meaning that instead of growing rice, they had to purchase it. The only legal option left to them was to catch and then sell fish in order to be able to afford to buy rice needed for their family.⁶¹² The situation was simply put: "If we cannot catch fish, we cannot eat rice"⁶¹³.

Fisheries

The many resettled villagers who are not able to meet their daily demands for rice have turned to fishing in the reservoir with the caught fish either being consumed, preserved or sold. Fisheries is the main source of both protein and income for those living on the Plateau and the NTPC figures suggest that a sizeable 38% of household income on the Nakai Plateau is from fishing activities.⁶¹⁴ Even so, there are serious concerns regarding the impacts of the reservoir on fish health and populations. The blocking of migration routes that occur when a dam is built results in extinction in the local area of these migratory fishes, and it was estimated that 33-55% of the Nam Theun's fish were migratory before the closing of the dam.⁶¹⁵ The conditions within a reservoir favour large predatory fish such as carp, and as a result, smaller fish populations tend to be wiped out. This is particularly concerning because a large amount of vital micronutrients in the Laotian diet come from these small fish that are eaten whole – leading to these small, wild fish being referred to as the "milk

⁶⁰⁹ McDowell, Scudder, and Talbot, "18A and B PoE Report", 13; McDowell, Scudder, and Talbot, "21A and 21B PoE Report", 5, 16-17.

⁶¹⁰ McDowell, Scudder, and Talbot, "19th PoE Report", 33.

⁶¹¹ Author interview, Villager: Village 9, Nakai Plateau, Khammouane Province, Lao PDR (October 2011).

⁶¹² Many villagers have turned to the rampant illegal logging trade – especially of teak wood.

⁶¹³ Author interview, Villager: Village 9, Nakai Plateau, Khammouane Province, Lao PDR (October 2011).

⁶¹⁴ NTPC, "Nakai Resettlers' Reality"; See also: McDowell, Scudder, and Talbot, "21A and 21B PoE Report", B13.

⁶¹⁵ Tyson R. Roberts, "Fluvidice: An Independent Environmental Assessment of Nam Theun 2 Hydropower Project in Laos, with Particular Reference to Aquatic Biology and Fishes," (Bangkok: Institute for Development Anthropology, September 2004), 15.

of Southeast Asia⁶¹⁶. There are other concerns regarding the health of the fish in the reservoir and the impact on residents of the Nakai Plateau, such as the potential for toxic chemicals like mercury and DDT deposits to work their way into the food chain.⁶¹⁷

These issues aside, following the closure of the dam the amount of fish available to villagers of the Nakai Plateau increased greatly due to what is referred to as the 'windfall fishery', where "large amounts of biological material create nutrient-rich water, favourable for plankton feeding fish, as well as large areas for spawning and a low density of predators"⁶¹⁸. This was expected to last between 5-10 years, but instead the fishery rapidly declined in 2009, only two years after enclosure.⁶¹⁹ In late 2011, villagers reported that fishing stocks had decreased greatly over the previous years with some estimating decreases in catches of 50-90% since the windfall period. They also reported declines in the value of fish.⁶²⁰ The POE consistently reported illegal fishing in the reservoir by outsiders with greater fishing and business skills, giving them an advantage over the resettlers.⁶²¹ The competition for fish between skilled fisherman and unskilled villagers may help to explain why villagers have reported lower prices for their fish even as their own catch decreases.

In addition to competition, one of the largest strains on the fishery in the reservoir is the decomposing biomass that washes in and is captured behind the dam wall, as well as the rotting vegetation on the floor of the reservoir. Before the infilling of the reservoir, independent research indicated a likelihood of anoxic conditions following impoundment, leading to fish kills and prohibiting the reproductive cycle of fish. The large amount of rotting biomass in the Nam Leuk reservoir was used as an example of the way anoxic conditions can lead to fish kills in dam reservoirs and downstream from it.⁶²² A separate report found that the anoxic conditions could lead to "(a)t best,

⁶¹⁶ David J.H. Blake, "A Review of the Nam Theun 2 Environmental Assessment and Management Plan (EAMP) as It Pertains to Impacts on Xe Bang Fai Fisheries," (Berkeley: International Rivers, January, 2005), 12.

⁶¹⁷ Guy Lanza, "Review of the Water Quality Assessment (EAMP) Proposed Nam Theun 2 Hydroelectric Project," (Berkeley: International Rivers, January 2005), 5; Roberts, "Fluvidicide", 19-21.

⁶¹⁸ NTPC, "Nakai Resettlers' Reality", 25.

⁶¹⁹ NTPC, "Nakai Resettlers' Reality"; McDowell, Scudder, and Talbot, "15th PoE Report", 26,29; Roberts, "Fluvidicide", 33.

⁶²⁰ Author interview, Villager: Villages 8 and 9, Nakai Plateau, Khammouane Province, Lao PDR (October 2011).

⁶²¹ McDowell, Scudder, and Talbot, "16th PoE Report", 20-21; McDowell, Scudder, and Talbot, "21A and 21B PoE Report", B13.

⁶²² Lanza, "Review of the Water Quality Assessment NT2", 7-8. See also: Roberts, "Fluvidicide", 19.

a relatively simple ecosystem...with a small number of species present. At worst, the reservoir will become largely devoid of life, except for invasive aquatic weeds and small islands of survivor fish species..."⁶²³

These risks were well known by the NTPC and this was demonstrated in their Water Quality Monitoring document (WQM) which indicated that the lower 6-8 metres of the reservoir would be anoxic which, according to the NTPC, would only impact on 3% of the reservoir.⁶²⁴ This inexplicably ignores the fact that the majority of the reservoir is less than 10 metres deep, meaning that the portion of the reservoir affected by anoxia is far greater.⁶²⁵ The understanding of the risks associated with anoxia were also demonstrated in the NTPC's duty to clear biomass before the infilling of the reservoir.⁶²⁶ Instead of a comprehensive clearing program, what occurred was ad-hoc removal of the biomass that was, at times, used as a cover to remove the highly valuable rosewood.⁶²⁷ The delay was so significant that shortly before the closing of the dam, the plan to clear 3,000 hectares of land was abandoned with only half that amount being considered possible.⁶²⁸ Although additional funds were allocated for the task, the effort was too little and too late. An elder in a village on the Nakai Plateau witnessed what occurred when the contractors came to clear the biomass near his own village, claiming that instead of clearing all the biomass, they simply removed the valuable rosewood and left the rest.⁶²⁹ When he requested permission from the NTPC to remove the remainder of less valuable trees in order to supply his village with timber, he was refused. He pointed out the rotting trees he was referring to, standing in the flooded area of the reservoir (figure 16).⁶³⁰

⁶²³ Eric Theiss, "Reservoir Fisheries Predictions for the Nam Theun 2 Hydroelectric Project," (Berkeley: International Rivers, February, 2005), 11.

⁶²⁴ Theiss, "Reservoir Fisheries Predictions NT2", 4; Lanza, "Review of the Water Quality Assessment NT2", 7-8.

⁶²⁵ Roberts, "Fluvicide", 7.

⁶²⁶ David McDowell, Thayer Scudder, and Lee M. Talbot, "Reports 13A and 13B of the International Environmental Panel of Experts," (Manila: Asian Development Bank, 8 February and 4 April, 2008), A18.

⁶²⁷ David McDowell, Thayer Scudder, and Lee M. Talbot, "Twelfth Report of the International Environmental Panel of Experts," (Manila: Asian Development Bank, 29 September, 2007), 20.

⁶²⁸ McDowell, Scudder, and Talbot, "13A and 13B PoE Report", 18-19A.

⁶²⁹ Author interview, Village Elder: Village 8, Nakai Plateau, Khammouane Province, Lao PDR (October 2011).

⁶³⁰ Author interview, Villager: Village 8, Nakai Plateau, Khammouane Province, Lao PDR (October 2011).



Figure 16: Dead trees in the reservoir of the Nam Theun 2 dam (author photo)

The delay in removing the biomass on the Nakai Plateau extends greatly the anoxic potential of the reservoir and has resulted in serious negative consequences for fisheries both within the reservoir and downstream on the XBF, as well as the health of villagers downstream.

Forestry

The fourth livelihood pillar according to the World and Asian Development Banks is forestry. The lack of biomass clearance for fisheries above is strongly related to the forestry sector. The rosewood, or what locals sometimes refer to as teak, is a highly valuable commodity on the Nakai Plateau. As a result, it was more profitable for NTPC contractors tasked to clear the entire biomass from the reservoir area to clear only this valuable commodity from the impoundment area and leave the rest, than to harvest the other less valuable wood at the same time. This practice is not uncommon and there are now many illegal forestry operations underway with many villagers participating as a way of making ends meet.

This, of course, was not what the livelihood pillar of forestry was designed to be. In 2003, the Village Forestry Association (VFA) was established with a concession of

23,000 hectares of forest to be managed over a period of 70 years.⁶³¹ The VFA was designed to ensure that all profits from forestry in the concession area are shared amongst resettlers, providing a significant long term income for villagers. Cash dividends from forestry activity – regardless of whether they are involved in forestry or not – are paid to villagers, at the same time as providing employment opportunities. Irregular dividends have been paid, as high as US\$150 per villager in 2010.⁶³² It was originally hoped that the forestry pillar would provide a third of the resettler's income.⁶³³

A combination of poor management, poor planning, excessive taxation and a loss of trust between management of the VFA and resettlers has resulted in an almost totally ineffective VFA.⁶³⁴ The POE reports contain a litany of concerns and complaints regarding the illegal cutting and collection of rosewood, with consistent calls to curb the practice. This “epidemic of illegal rosewood cutting”⁶³⁵ has been enabled by the development of new roads and tracks across the plateau connecting this remote area more effectively with neighbouring Vietnam. It was apparently well-known, and explained to me, that the many silver Hyundai vans trudging in and out of the newly built villages were transporting this valuable cargo.⁶³⁶

It seems that many villagers find it more profitable to participate in the highly lucrative illegal logging that is occurring.⁶³⁷ One villager was happy to show me the family's stash of rosewood sitting under the house under a blue tarpaulin, waiting to be picked up by one of the silver vans. She informed me that her husband was out collecting wood, and that it helped to pay for things like petrol and rice.⁶³⁸ The willingness to participate in these activities may stem from the perceived corruption surrounding the logging industry on the Nakai Plateau.⁶³⁹ Selling wood may also be a reflection of the lack of livelihood options on the plateau. As one villager explained:

⁶³¹ Sacklokham, Kouangpalath, and Kouonsavath, "Compensation and Livelihood Restoration NT2", 83.

⁶³² Sacklokham, Kouangpalath, and Kouonsavath, "Compensation and Livelihood Restoration NT2", 83-84.

⁶³³ McDowell, Scudder, and Talbot, "22nd PoE Report", 17.

⁶³⁴ David McDowell, Thayer Scudder, and Lee M. Talbot, "Twentieth Report of the International Environmental Panel of Experts," (Manila: Asian Development Bank, 2 February 2013), 26-27.

⁶³⁵ McDowell, Scudder, and Talbot, "12th PoE Report", 29.

⁶³⁶ Author interview, Villager: Village 3, Xe Bang Fai Basin, Khammouane Province, Lao PDR (October 2011); Author interview, Villager: Villages 8 and 9, Nakai Plateau, Khammouane Province, Lao PDR (October 2011).

⁶³⁷ Sacklokham, Kouangpalath, and Kouonsavath, "Compensation and Livelihood Restoration NT2", 84.

⁶³⁸ Author interview, Villager: Village 9, Nakai Plateau, Khammouane Province, Lao PDR (October 2011).

⁶³⁹ McDowell, Scudder, and Talbot, "16th PoE Report". 16-18.

“For now, selling the wood from here is the only way we can earn money to eat; how else do we make a living? We can sell to buyers from Vietnam, Thailand and also Lao people. There is no land for farming here, so we cannot earn money that way. As for fishing, we can usually only make a little money because the price of fish is set so low by the fish buyers [middlemen] from Lak Sao.”⁶⁴⁰ The illegal logging has been overlooked by local government and has received no sustained attention from the provincial or national governments.⁶⁴¹ Enforcement of the law on this matter rarely occurs as local authorities tend to look the other way or are actively participating in it. This is hardly surprising given that local authorities can earn more in a week in bribes to look the other way than the Lao government pays them in a year.⁶⁴²

Although the short-term profits have been high, the long-term consequence of this well-organised rapine of the forests of the Nakai Plateau is the removal of a sustainable form of income for resettlers. The POE deem the sustainability of the pillar a “remote prospect”⁶⁴³ and by as late as 2013 a full forestry inventory had yet to be completed.⁶⁴⁴ The forest inventory may be a moot point given that there are strong indicators that the resource is in rapid decline. Many who were involved in the practice now report no new income or purchases from this income in several years. Traders reported in 2013 that rosewood is so scarce on the plateau that harvesters are now collecting the roots and branches of trees.⁶⁴⁵ This completes the cycle of unsustainability, the removal of roots meaning that no substantial new growth of rosewood can be expected for decades, if at all. In under ten years, the forestry of the Nakai plateau has gone from a potentially renewable, long-term source of income, to a low yielding, poor and unproductive forestry. It is undoubtedly not a pillar of sustainability on the Nakai Plateau and has no prospect of providing a third of ressetler’s income in the long term.

⁶⁴⁰ Tanya Lee, "Nam Theun 2 Affected Villagers Put Illusions of the 'Model Project' in Doubt," *International Rivers*, 12 March, 2014: <http://www.internationalrivers.org/blogs/294-0>.

⁶⁴¹ McDowell, Scudder, and Talbot, "22nd PoE Report", 17-20.

⁶⁴² Author interview, Villager: Village 8, Nakai Plateau, Khammouane Province, Lao PDR (October 2011).

⁶⁴³ McDowell, Scudder, and Talbot, "22nd PoE Report", 18.

⁶⁴⁴ "Nam Theun 2 Annual Update 2013".

⁶⁴⁵ McDowell, Scudder, and Talbot, "22nd PoE Report", Appendix 2.

Environmental changes and sustainable livelihoods on the Nakai Plateau

The living conditions of many of those who have been resettled on the Nakai Plateau have improved. Livelihood options have changed significantly, and villagers are engaging in what appear to be unsustainable practices to make ends meet. The NTPC is contractually obligated to ensure that all resettlers have an income of roughly double what it was before relocation, that is, above the national poverty line of 186,000 kip per month (around US\$ 23).⁶⁴⁶ Although the NTPC claim that the average income (measured as consumption) is more than triple the established poverty line value, it is clear that this consumption has been driven by the windfall in fisheries and income from legal and illegal rosewood collection, both of which are now in sharp decline.⁶⁴⁷ At the same time, an increase in debt – 25% of all households on the plateau – and a failure of the ‘off-farm pillar’ designed to provide vocational training and skills for non-renewable resource based livelihood options, means that human development and security are far from assured on the Nakai Plateau. For this reason, the resettlement program, with all its checks and balances, is not nearly ready to be declared a success. At this stage, the prospects of long-term success appears slim, but more time will be needed to assess whether this ‘model dam’ can provide long term livelihood options for resettled villagers around the dam site.

The Xe Bang Fai

The biggest environmental and social concerns before construction commenced on the NT2 were those downstream, along the Xe Bang Fai (XBF).⁶⁴⁸ This is because the project is what is referred to as a trans-basin hydropower project, diverting the majority of water from one river into another. In the case of the NT2, 93 of the flow of the Nam Theun River is diverted into the XBF. It was known well before the dam commenced operation that this would mean “the hydrological and geomorphological characteristics of the Xe Bang Fai (would) totally change”⁶⁴⁹. In essence, the XBF is no longer the same river. This brings with it immense pressure on the ecosystem of

⁶⁴⁶ NTPC, "Nakai Resettlers' Reality", 35.

⁶⁴⁷ NTPC, "Nakai Resettlers' Reality", 4.

⁶⁴⁸ See: "Summary Environmental Impact Assessment: Nam Theun 2 Hydroelectric Project," (Manila: Asian Development Bank, November 2004).

⁶⁴⁹ David J.H. Blake, "A Review of the Adequacy of Compensation Measures for Communities Living Along the Xe Bang Fai River Nam Theun 2 Hydropower Project, Lao PDR," (Berkeley: International Rivers, January, 2005), 19.

the XBF and since operations began, has fundamentally changed the nature of the river. This in turn has created immense challenges to the 120-150,000 villagers who live in close proximity to the river, as they are forced to adapt to these changes.

The changes to the ecosystem of the XBF has brought with it severe consequences in terms of food and water security – that is the quality, quantity and access to these resources. It is somewhat artificial to divide these two issues – due to the complex and multi-faceted ways in which they interact – but for clarity they will be discussed in separate sections below. In terms of water security there are two main issues: the change in the flow regime of the river, and the negative impacts on potable water. In regards to food security, the total loss of riverside gardens, the negative impacts on rice production and the destruction of fisheries are the most serious concerns. It was well known before the dam began operation that there would be serious issues on the XBF, and that these would impact a much larger number of people. However, the compensation for affected villages on the XBF was much less than that given to resettlers on the Nakai Plateau. As a result of inadequate compensation and in the absence of mitigation, the sustainability of livelihoods on the XBF is in even greater jeopardy than those of the Nakai Plateau.

Water Security

Although the NTPC have provided sanitation such as communal toilets and access to drinking water through wells, the people of the XBF are experiencing very serious hardships. The quality of the water of the XBF has changed significantly. From being a clear, slow running river in the dry months, it is now turbid and fast flowing.⁶⁵⁰ Whereas previously, residents of the XBF were able to draw water from the river for drinking and bathing, this is no longer an option. The water of the XBF is now full of sediment and other elements from the Nakai Plateau. The heavy sedimentation decreases light penetration into the water which in turn results in lowered oxygen levels which can be fatal for fish. This adds to the already low oxygen levels that

⁶⁵⁰ Kong Xebangfai, "Impacts on the Water Quality of the Xe Bang Fai River as a Result of the Nam Theun 2 Dam," in *Land, Water, Rights: Voices from the Tibetan Plateau to the Mekong Delta* (Chiang Mai, Thailand: EarthRights International, 2012), 123-24.

have resulted from the anaerobic conditions in the reservoir, as well as the additional mercury, ammonia, methane and hydrogen sulphide pollution.⁶⁵¹

As a result of the poor quality of the water, it is unsuitable for washing and contact more generally. In each village visited on the XBF, villagers complained about skin rashes that had begun since the commencement of hydropower operations which occur whenever they come into contact with the water. This is particularly problematic when planting rice and fishing – both activities that generally require long exposure to the water. Villagers have no knowledge on the actual cause of the rash, but all villagers have come to understand that exposure to the waters of the XBF now has negative consequences. Although the rash coincided with the beginning of hydropower operations, the NTPC make the doubtful claim that the rash is not linked. Nevertheless, the fact that almost the entire dry season flow now comes from the Nakai reservoir strongly suggests that the root cause of these water issues stems from there.

Obviously the changes in the quality of the water means that it is no longer suitable for drinking either. This was a known consequence before commencement of hydropower operations and as a result, one of the downstream compensation measures was the digging of wells for villages that used to rely on the waters of the XBF for their potable water. Unfortunately, the well program has been less than successful. In many villages only a fraction of the wells are useable. Villagers complain about 'bitter water' that is undrinkable and, as a result, many are forced to travel considerable distances to access safe water. Some villagers have resorted to other means such as boiling water, storing rainwater in large jars during the wet season or purchasing water for drinking.⁶⁵²

Prior to the NT2, villagers along the XBF were able to supply themselves with water year round by collecting rainwater in the wet season and digging small wells along the banks of the river during the dry season. Since the start of operations, the possibility of using the riverbanks for this purpose has gone. The summer flow of the XBF has increased by a factor of ten, raising the river by over five metres (ADB

⁶⁵¹ Lanza, "Review of the Water Quality Assessment NT2", 7; Blake, "Review of the NT2 EAMP", 15; Roberts, "Fluicide", 19.

⁶⁵² Xebangfai, "Impacts on the Water Quality of the Xe Bang Fai," 124.

March 2005 p.58 (appendix 4) and bringing with it severe erosion.⁶⁵³ Although part of the mitigation plan for the XBF was to provide anti-erosion measures such as reinforcing riverbanks, this did not eventuate, due in large part to the delayed and then slow roll-out of compensation and mitigation measures downstream.⁶⁵⁴

The changed flow brings with it less measurable effects such as a growing fear of the river. Many villagers now report being too afraid to fish due to the fast flowing deep water. Of even more concern to some is the irregular flow. Although the average flow has increased by 220 cubic metres per second (m³/s) hydropower generation is regularly ceased on a Sunday, dropping the flow to only 80 m³/s, significantly lowering the level of the river, until it rises again suddenly on Monday. This sudden change in the levels of the XBF is scheduled to coincide with the low demand for electricity on a Sunday in Thailand, where the majority of the NT2's energy is sold. This great fluctuation comes with serious implications to those who live downstream, including damage to irrigation pumps, boats and potential loss of life, and also demonstrates the prioritisation of the river as a source of energy rather than a provider of livelihoods for the tens of thousands of people who live by the river.

Food security

By far the most serious consequence to human security as a result of the construction of the NT2 is the tenuous situation residents of the XBF find themselves in relation to food. The massive changes to the ecosystem of the XBF has led to the annihilation of riverside gardens along the length of the XBF. As is the case throughout the entire Mekong River Basin, during the dry season, villagers grow vegetables in riverbank gardens in the rich soil beside the river. But the addition of virtually the entire flow of the Nam Theun River into the XBF has meant that the river banks have disappeared completely along much of its length.

The Asian Development Bank predicted that the XBF would widen on average between 10.7 and 15.9 metres and that the erosion would be "slow and obvious, giving communities time to adjust"⁶⁵⁵. No scientific evidence or precedent was given

⁶⁵³ ADB, "Summary EIA NT2", 27.

⁶⁵⁴ Author interview, Villager: Villages 1 and 6, Xe Bang Fai Basin, Khammouane Province, Lao PDR (October 2011).

⁶⁵⁵ ADB, "Summary EIA NT2", 29.

for these figures. The NTPC estimated that as a result of this erosion, 30-70% of these gardens would initially be lost but it was “expected that these losses (would) be quickly recovered by moving gardens higher up the banks”⁶⁵⁶. They also believed that the erosion would become less noticeable in the lower reaches of the XBF, closer to the Mekong, suggesting that “by the time the river reaches the bridge on Road 13 the loss of land is predicted to be negligible”⁶⁵⁷. As it turned out, these assessments were hopelessly optimistic. The first place I visited on the XBF was the village of Sok Bo, some 30 kilometres towards the Mekong from the bridge on Road 13. The erosion this far away from the confluence of the downstream channel and the XBF was severe (see figure 17).



Figure 17: Severe Erosion at Sok Bo Village (author photo)

From Sok Bo, all the way up to Mahaxai – the first major town on the XBF after its confluence with the downstream channel – the riverbank erosion is severe. Instead of gently sloping banks leading down to the river, as has been the case for generations, all that is left is sheer walls of earth that frequently collapse. Villagers

⁶⁵⁶ "NGO Visit to the Proposed Nam Theun 2 Hydroelectric Project in Laos, December 2003," (Berkeley: International Rivers, February 2004). 7.

⁶⁵⁷ ADB, "Summary EIA NT2", 29.

who have been able to move their gardens further up what riverbanks remain, find that the costs can be prohibitive because they now need expensive fertiliser and watering is either labour intensive or expensive due to the costs of energy for pumping.⁶⁵⁸ But the majority of villagers have been unable to shift their riverside gardens due to the absence of appropriate land. The option of riverbank gardens has therefore effectively been wiped out in many places, taking with it a vital source of generational food security and income.

Although the NTPC was encouraged to consider providing villagers with alternatives such as inland gardens with irrigation – as was the case for the downstream areas of the Theun-Hinboun project – this did not occur. Instead, as compensation, the NTPC gave a one-time payment of 5,000 kip (about US\$0.65) per square metre for riverbank garden losses. Many missed out on compensation because they were not utilising their gardens at the time the NTPC was assessing who should be covered.⁶⁵⁹ Those who were given money complain that this one-time payment does not come close to compensating what were generational sources of food security. The payments were generally the equivalent of one or two years-worth of produce, yet the impacts will continue for at least the 25 years of the concession period.

⁶⁵⁸ Ian G. Baird, Bruce Perry Shoemaker, and Kanokwan Manorom, "The People and Their River Revisited: The World Bank's Hydropower Model, Nam Theun 2 and Impacts in the Xe Bang Fai River Basin in Laos," (2015).

⁶⁵⁹ Author interview, Villager: Villages 4, 5 and 6, Xe Bang Fai Basin, Khammouane Province, Lao PDR (October 2011); Author interview, Local Non-Government Organisation Representative, Bangkok, Thailand (September, 2011); Author interview, International Non-Government Organisation Representative, Bangkok, Thailand (September, 2011).



Figure 18: Destruction of riverside gardens near Mahaxai (author photo)

The loss of riverbank gardens removes an important source of food security for the tens of thousands of villagers who live along the banks of the XBF. The losses are complete and indefinite, meaning that villagers have lost the ability to grow seasonal fruit and vegetables in the fertile soils of the riverbank during the low-water, dry season. This removes an important source of vitamins and minerals and effectively brings to an end what has been a key part of the food security mix in the XBF for many generations.

The second major impact on food security is the negative affects on rice production. This has two main components to it. Firstly, the decrease in production due to the

quality of the water and the fluctuating water levels, and secondly, the impacts from flooding. Many villagers along the XBF complain that the water from the river is 'dirty water' or in other words, polluted.⁶⁶⁰ Up and down the river there are complaints that rice yields are down since the start of operations. Rice has also been impacted with yields decreasing since the dam began operation. One of the promised benefits of the dam was higher low season flows that would make irrigating easier.⁶⁶¹ The erratic flows of the river mean that many irrigation pumps have broken or have to be shifted frequently.⁶⁶² Large fluctuations in the water level damages pumps if they are not moved, and in some cases it takes up to ten men to adjust the pump each time the river changes level. This makes the low flow on Sundays particularly problematic. Previously, with a regular wet and dry season, this was not a problem. The promised benefits of easier and cheaper irrigation have therefore not eventuated. Villagers are left with the cost of regularly moving and fixing pumps that would normally only need moving and maintaining a few times a year. Additionally, the cheaper electricity prices that were promised as a means of decreasing the cost of irrigation have not eventuated. All villagers interviewed around both the XBF and the Nakai plateau complained that the price of electricity has increased significantly since the dam was built.

The exceptionally high levels of rain in the 2011 wet season exacerbated an already challenging set of environmental circumstances for the XBF and those whose livelihoods depend on it. As anticipated, flooding on the upper and lower XBF increased significantly once the dam started operation.⁶⁶³ The flooding in 2011 was the worst in living memory.⁶⁶⁴ The rice crop has been devastated along the length of the river. In many villages, including the upper XBF town of Mahaxai, the entire annual rice crop was destroyed. In one lower XBF village, of 450 hectares, only 10

⁶⁶⁰ Author interview, Villager: Villages 1 to 6, Xe Bang Fai Basin, Khammouane Province, Lao PDR (October 2011).

⁶⁶¹ "Summary EIA NT2", 28.

⁶⁶² Author interview, Villager: Villages 3 to 6, Xe Bang Fai Basin, Khammouane Province, Lao PDR (October 2011).

⁶⁶³ The NTPC claimed that the NT2 did not add to the problem because they stopped dam releases throughout the flooding. Due to the opaque conditions under which they operate, it is difficult to ascertain if this was the case. See: Aiden Glendinning, "Press Release - Statement of the Khammouane Flooding," *Nam Theun Power Company*, August 2011:

<http://www.namtheun2.com/images/stories/Press/Khammouane%20Flooding%20Aug2011.pdf>.

⁶⁶⁴ Author interview, Village Elder: Nakai Plateau, Khammouane Province, Lao PDR (October 2011). Shortly after this interview I spoke with a woman who claimed to be 110 years old. She stated that she had never seen flooding like this year. In every village visited the same claim was made.

hectares were harvestable.⁶⁶⁵ The pattern is repeated throughout the region, with many dam overflows occurring, impacting on rice stocks throughout Laos.⁶⁶⁶ The food security impacts from the floods were more than just losses of rice. All villages experienced losses of livestock including cattle, buffalo, goats, chickens and ducks. Even wild options such as stocks of frogs were destroyed.⁶⁶⁷



Figure 19: Villager in Mahaxai showing the level of flooding in 2011 (author photo)

The increased flow has created another food security dilemma. All the villages along the XBF are involved in fishing. With an increase of 5.8 metres due to the increased summer flow, fish are now difficult to catch as fishers are not equipped for these conditions.⁶⁶⁸ Villagers also report being afraid of the river due to the high flows. Instead of fishing in the main river, villagers now try to catch fish in smaller streams

⁶⁶⁵ Author interview, Villager: Village 6, Xe Bang Fai Basin, Khammouane Province, Lao PDR (October 2011).

⁶⁶⁶ Khamphone Syvongxay, "Floods Deplete Rice Seed Stocks " October 14 , 2011: http://www.vientianetimes.org.la/FreeContent/free_Floods.htm.

⁶⁶⁷ Author interview, Villager: Village 6, Xe Bang Fai Basin, Khammouane Province, Lao PDR (October 2011).

⁶⁶⁸ "Summary EIA NT2". 27.

or ponds, although the sustainability of this is in question. Other aquatic products such as “shellfish, edible seaweed and small aquatic animals that once lived in the shallow water along the river banks have (also) disappeared”⁶⁶⁹ taking with them yet another source of food.



Figure 20: Flooding in the town of Mahaxai on the XBF, July, 2011. Photo from: <https://ssl.panoramio.com/photo/106585509>

Attempts to shift the source of fish from wild catch to aquaculture and fish ponds have been largely unsuccessful, with many villagers ending up in debt due to the high costs and risks involved.⁶⁷⁰ Building and maintaining a fish pond is an expensive exercise as it requires inputs such as fish food and antibiotics and requires a level of technical knowledge that villagers currently do not possess. Although the NTPC provides a micro-lending system known as a ‘community bank’,

⁶⁶⁹ Lee, "Nam Theun 2 Affected Villagers Put Illusions of the ‘Model Project’ in Doubt."

the lack of livelihood reskilling to accompany this, has resulted in the failure of fish farms and left many villagers in debt with an uncertain financial future.

To cope with the losses, villagers sell buffalo if they have them, or else borrow from the community fund set up by the NTPC giving loans of around US\$100 at low interest repayments. Villagers who borrowed for rice that has been washed away or fish ponds that did not work, or pig farms that failed, are now in debt and must try to find ways to pay their debts with meagre means. Their future is uncertain and many now rely on government subsidies for rice and electricity. In fact the future for all of those who live along the XBF is uncertain. With losses to rice, fisheries, fresh water and livestock, the villages around the XBF are potentially sitting on a food security disaster. As one village headman put so succinctly: "I cannot talk about (the NTPC), but if they build more dams we will die"⁶⁷¹.

The NT2 is meant to be a 'best practice' dam, with careful planning, preparation, funding and villager compensation. The NT2 and the NTPC even won an award for "Hydroelectric Power Project of the Year" from Global Energy Magazine.⁶⁷² Some villages of the XBF are better off than others, but the worst are destitute with few livelihood options. The argument that dams are decreasing poverty in Laos is evidently untrue for those that live downstream of the dam. If the negative impacts described above are the results of a 'model' dam, then there is no reason to expect that the impacts of a worst practice, poorly researched dam, such as the Xayaburi, will not be even more disastrous.

Section Two: Human Security and the Nan Theun 2

Summary of Impacts

The evidence above demonstrates that the challenges facing those affected by the NT2 are human security issues – both from the narrower environmental security perspective and a broader point of view. It is important, therefore, to bring these issues to light in respect to the way that environmental security and human security concerns interact. The benchmark for human security used here are those aspects

⁶⁷⁰ Lawrence, "Nam Theun 2: Trip Report and Project Update", 8.

⁶⁷¹ Author interview, Village Headman: Village 1, Lower Xe Bang Fai Basin, Khammouane Province, Lao PDR (October 2011).

⁶⁷² Sarah O'Toole, "Finally, the Results of the 2011 Global Energy Magazine Awards are..."

<http://www.globalenergymagazine.com/2011/04/and-the-winners-of-the-2011-global-energy-magazine-readers%E2%80%99-poll-awards-are%E2%80%A6/>.

identified by Barnett as most crucial to human security, that is, the ability for people to satisfy their most basic health needs through access to nutritious food, clean air and water, and shelter. That being the case, the human security outcomes for those on the Nakai Plateau are mixed. Locals report that their housing situation is better than what it was in their previous villages. The POE draws the conclusion that the housing infrastructure on the plateau is sustainable in the long-term and most villagers report that they have adequate access to a supply of clean drinking water.⁶⁷³ These are undoubtedly positive outcomes as far as human security is concerned – although it must be kept in mind that these achievements have come about after they have been forcibly removed from their ancestral lands.

As far as food is concerned, the long term prospects of sustaining their own food security is deeply uncertain. Villagers are now competing with commercial interests for their fish supply from the reservoir. There is also doubt about the quality of the fish now available as well as the degree of mercury poisoning that may be occurring. Furthermore, the lack of biomass clearance before the infilling of the reservoir has resulted in anoxic conditions that may hamper fish production for many years to come.⁶⁷⁴ Also of great concern is the rice supply. Plots given to villagers as compensation for the lands lost to the reservoir are frequently inappropriate for rice cultivation, too small to support entire families, difficult to irrigate and not in close enough proximity to the new villages. Locals are still reliant on the government for rice or are forced to buy it with the proceeds of other livelihood activities such as fishing, animal husbandry and forestry.

These other livelihood options are far from sustainable, however, and this is already evident with the increasing competition for fish. Furthermore, many villagers were forced to sell their buffalo – essentially their savings plan – in order to be relocated, and the lack of veterinary services has meant that many other animals have died since relocation. In the years immediately following the construction of the dam and infilling of the reservoir, forestry – namely the collection and harvesting of the valuable teak or rosewood – appeared to provide an alternative form of income. This most lucrative of livelihood alternatives has now come to a halt and the future of

⁶⁷³ McDowell, Scudder, and Talbot, "21A and 21B PoE Report", 5.

⁶⁷⁴ Eric Theiss, "Reservoir Fisheries Predictions for the Nam Theun 2 Hydroelectric Project," (Berkeley: International Rivers, February 2005).

those on the Plateau looks bleak given the lack of training for alternative livelihood options.

The outcomes in terms of human security are much worse in the downstream area along the XBF. It is unreasonable to think that the majority of water from one river can be diverted into another of similar size and for there to be minimal consequences. Even so, assessments of the downstream impacts before the dam construction and river diversion were generally optimistic about the outcomes. In terms of food security, the increased water flow was destined to lead to a benefit for agriculture by way of increased rice cultivation and lower costs for irrigation pumping totalling US\$ 5-7 million.⁶⁷⁵ According to World Bank estimates, a maximum of only 19 irrigation systems across the entire XBF system would be impacted by the changes in water levels, easily compensated by the \$50,000 allocated for the task.⁶⁷⁶ Fisheries losses (initially estimated at around US \$4 million) were expected to be fully mitigated through aquaculture, and a combination of rice and fish farming.⁶⁷⁷

Instead, the food security outcomes have been overwhelmingly negative. The irregular water flows have destroyed irrigation pumps up and down the XBF, hindering the pumping of water and requiring extra labour to adjust the intact irrigation systems to the irregular levels of the river. Furthermore, the polluted water from the reservoir is actually killing crops rather than growing them, in addition to irritating the skin of those who come in contact with it. The irregular and constantly fast flowing water of the river has had a devastating impact on fisheries with some estimates of loss at 85%. Fishers report that they are afraid of the fast flowing water and are unwilling or unable to carry out traditional fishing activities. Although suggestions that aquaculture would go a long way to mitigating the loss in fisheries, there are few examples of working fish farms along the length of the XBF and certainly nothing approaching the amount needed to replace these losses.

Given the importance of fish and rice to the diets of Laotians in general and locals of the XBF in particular, the losses in rice and fish are serious long-term human security concerns. This is compounded by the almost total loss of generational

⁶⁷⁵ Laplante, "Economic Analysis of NT2", 85-90.

⁶⁷⁶ Laplante, "Economic Analysis of NT2", 76.

⁶⁷⁷ Laplante, "Economic Analysis of NT2", 73; McDowell, Scudder, and Talbot, "13A and 13B PoE Report"; Blake, "Adequacy of Compensation Measures XBF".

riverside gardens that have also been inadequately compensated. Additionally, there have been losses of other food options such as frogs and poultry that have been destroyed by the severity of the flooding that has followed the commencement of operations. Whether the particularly severe flooding of 2011 was as a result of the operation of the NT2 or natural variations occurring as part of a changing climate is largely irrelevant.⁶⁷⁸ What is clear is that the impacts of the NT2 have left locals of the XBF highly vulnerable to such perturbations.

In addition to impacts on food security, the change in the water quality of the XBF bring with it additional problems. Although the digging of wells by the NTPC was designed to mitigate the new unsuitability of XBF water as a potable source, the evidence shows that the majority of villagers and villages of the XBF downstream of the NT2 are certainly not better off. Many of the wells have failed or are unused due to 'bitter water' that is unsuitable for drinking. In some villages less than 40% of the wells dug by the NTPC are in working order. Some locals have resorted to using water from the XBF for washing and buying potable water from the NTPC. From relying on the river for a great majority of their livelihoods – fishing, irrigation, potable water, transport, gardens etc. – to now having a sense of unease or fear due to the fast flowing, polluted, damaging and destructive river, the relationship between the residents of the XBF and the river has fundamentally and irrevocably changed. How this can be quantified, measured or compensated for is unclear. What is clear is that the ecological destruction that has been wrought by the NT2 has created serious negative impacts in terms of human security on the XBF.

Vulnerability, Resilience and Agency

It is worth noting at this juncture the notions of vulnerability and resilience forwarded by Barnett and others as relevant to environmental security. If we are to consider one as a function of the other – that is to say that as resilience increases, so vulnerability decreases (and vice-versa), we are able to more quickly grasp the human security outcomes of the NT2.⁶⁷⁹ This can be achieved simply by asking the question: "Has the construction of the NT2 increased vulnerability or increased resilience?" It is abundantly clear that the environmental changes wrought by the NT2 have brought with them increased vulnerability: increased vulnerability to

⁶⁷⁸ Glendinning, "Press Release - Statement of the Khammouane Flooding."

⁶⁷⁹ Barnett, *The Meaning of Environmental Security*, 132-33.

economic perturbations due to livelihood losses; increased vulnerability to global climate change and localised severe weather events; and increased vulnerability to further unforeseen negative impacts of the NT2. The factors that tend to increase resilience have greatly diminished or disappeared on the Nakai Plateau and around the XBF including: a range of diverse and sustainable livelihood options; a healthy and functioning local ecosystem that provides the basics of subsistence; the ability to earn a sufficient income to pay for essentials and meet debt repayments; and the ability to participate in activities that decrease one's own vulnerability.

We can extend this idea further to the Global Environmental and Human Security (GECHS) program's conception of environmental insecurity that posits that when "people do not have enough options to avoid, or to adapt to environmental change such that their needs, rights and values are likely to be undermined, then they can be said to be environmentally insecure"⁶⁸⁰. This definition gives greater agency to individuals and communities affected by the NT2 to adapt to or avoid the harmful impacts of the NT2. The idea of the compensation measures and livelihood programs were, in a sense, designed to enable this and to assist residents of the Nakai Plateau and XBF to pursue other livelihood options that would assist them to adapt and thrive. This is as an alternative to having them simply rely on government welfare such as rice handouts. The failure of the livelihood and adaptation programs means that according to the GECHS definition, these individuals and communities are now environmentally insecure. When this perspective is combined with the ideas of vulnerability and resilience, the human security outcomes of the NT2 are clearly negative.

Civil Society and Human Security

There are no substantial studies of the NT2 from a human security perspective, engaging with the broader human security literature, drawing the links directly between the theory of human security and the construction of the NT2.⁶⁸¹ In fact, just as with the environmental security literature more generally, there is a dearth of

⁶⁸⁰ Richard A. Matthew et al., *Global Environmental Change and Human Security* (Cambridge, Massachusetts: MIT Press, 2010), 18.

⁶⁸¹ It should be noted that Baker, Cronin and Goh have all considered the issue from a superficial human security perspective – that is to say that their work does not engage deeply with the broader human security literature yet it considers the impacts of the NT2 and other hydropower projects in relation to their impacts on humans. See: Cronin and Hamlin, "Mekong Tipping Point"; Goh, "Developing the Mekong."; Baker, "Dams, Power and Security".

human security research into the impacts of hydropower in the Mekong. This is hopefully an omission that will be corrected in coming years. Yet, in a general sense, there is a broad normative discourse surrounding the rights of, and wrongs against, Laotians impacted by the NT2 and a raft of other hydropower dams in the region. This discourse is dominated by the many local, regional and international non-government organisations (NGOs) who have a long track-record of bringing to light the plight of those impacted by the negative effects of hydropower and other industrial developments in the MRB.

A range of local and international NGOs have been specifically involved with the NT2 including the Foundation for Ecological Recovery (Terraper), the Save the Mekong Coalition, WWF, Oxfam, Probe International and International Rivers.⁶⁸² Although not specifically involved with the NT2, a number of local NGOs are also involved in hydropower issues in the MRB more generally.⁶⁸³ Much of the literature produced by these NGOs revolves around the impacts of the dam in terms of the destruction to the local ecosystem, including the loss of fisheries, riverside gardens, and losses to food production capability. Alongside this is the harm that it has brought to the people of the Nakai Plateau and the XBF regarding loss of livelihoods and inadequate compensation. The focus of attention is either on the Laotian government (GoL) or the international financial institutions (IFIs), such as the World Bank and the Asian Development Bank who have financed the project. The corruption of the GoL is frequently highlighted as well as the opaqueness of the agreement signed with the NTPC. In regards to the IFIs, the often large difference between their words and actions, or their intent and the observed outcomes is emphasised in an attempt to

⁶⁸² "Nam Theun 2," *Foundation for Ecological Recovery*, 2008:

http://www.terraper.org/mainpage/key_issues_detail_en.php?kid=9&langs=en; Brown, "Redefining National Security (1978)."; "WWF Position Statement: Nam Theun 2 Dam Project, Lao PDR," *WWF*, May, 2003: <http://wwf.panda.org/?11621/WWF-Position-Statement-Nam-Theun-2-Dam-Project-Lao-PDR>; "ADB Greater Mekong Subregion Program," *Oxfam, Australia*, 2014: <https://www.oxfam.org.au/explore/infrastructure-people-and-environment/oxfams-work-on-infrastructure-development/adb-greater-mekong-subregion-program/>; Brady Yauch, "World Bank Dam in Laos an Environmental and Social Disaster, as Expected," *Probe International*, December 15, 2010: <http://journal.probeinternational.org/2010/12/15/world-bank-dam-in-laos-an-environmental-and-social-disaster-as-expected/>; Lee, "Nam Theun 2 Affected Villagers Put Illusions of the 'Model Project' in Doubt."

⁶⁸³ "NGO Forum on Cambodia," *The NGO Forum on Cambodia*, 2015: <http://www.ngoforum.org.kh/>; Myers, "Environment and Security."; "The Center for Water Resources Conservation and Development," *The Center for Water Resources Conservation and Development*, 2015: <http://www.warecod.org.vn/en/trang-chu/index.aspx>.

ensure their ongoing commitment to the project and in the hope that they can influence either the NTPC or the GoL to provide better human security outcomes.

What is missing from the NGO arguments is any real connection with the human or environmental security literature. Although implicit within the discourse, there is no explicit reference to human rights, human development or emancipation, nor are linkages made between the issues arising from the construction of the NT2 and the plethora of United Nations literature on the subject. The same can be said of the wider discourse that focuses on the Mekong Basin as a whole, although recently a consortium of local and international NGOs have taken Malaysia's Mega First Corporation – charged with the construction of the Mekong mainstream dam at Don Sahong – to Malaysia's Human Rights Commission.⁶⁸⁴

Rather than a new engagement with the human security literature, this move appears more in line with NGO tactics of raising awareness of these issues at the local, regional and international levels, in a variety of different settings. These are outsider tactics, designed to draw regional and international attention to the plight of hundreds of thousands of Mekong citizens who are affected by hydropower construction and the millions who will be, if the dam-building frenzy continues at its rapid pace. The tactics employed by the Mekong NGOs result from and are reflective of the almost total lack of transparency surrounding the construction of hydropower dams in the region and the almost total absence of community consultation with local stakeholders who will bear the majority of the costs of construction in terms of lost environmental services, livelihoods and ancestral land.⁶⁸⁵

It is unsurprising that these civil society groups do not engage with the idea of security more generally – apart from regular references to food security. It is somewhat surprising, however, that rather than consistently approaching hydropower issues from the perspective of rights, norms, and human security - as

⁶⁸⁴ Medilyn Manibo, "Mekong NGOs Takes Complaint Against Mega First to Malaysia's Human Rights Body," *Eco Business*, 7 November, 2014: <http://www.eco-business.com/news/mekong-ngos-file-complaint-against-mega-first-malaysia-human-rights-body/>.

⁶⁸⁵ See for example: Shalmali Guttal and Bruce Perry Shoemaker, "Manipulating Consent: The World Bank and Public Consultation in the Nam Theun 2 Hydroelectric Project," *Watershed* 10, no. 1 (July - October, 2004). For a more theoretical discussion of this issue, see: Lorraine Elliot, "Harm and Emancipation: Making Environmental Security 'Critical' in the Asia-Pacific," in *Critical Security in the Asia-Pacific*, ed. Anthony Burke and Matt McDonald (Manchester: Manchester University Press, 2007), 148-50.

may be expected of civil society – the discourse is often technical in nature, frequently arguing from an economic perspective.⁶⁸⁶ The arguments are varied. Some argue that the projected demand for energy in the region, and the likelihood of a glut of energy makes the NT2 – and continued dam construction throughout the region – unviable economically.⁶⁸⁷ Others argue that due to the high costs of construction, the price per kilowatt negotiated by the GoL (4.15 US cents per kilowatt hour) is not enough to cover costs and make a profit (estimated at 5.75 US cents per kilowatt hour).⁶⁸⁸ And yet others argue that the technical capabilities and oversight of the GoL are not adequate to ensure that the proceeds of the NT2 are distributed evenly.⁶⁸⁹ In something of a major contradiction, WWF actually forwards the NT2 and the controversial Se San cascade as reasonable alternatives to mainstream dams, due to the major disruption to the connectivity of the Mekong's ecosystem caused by mainstream dams.⁶⁹⁰ They fail to highlight that in regards to human security concerns, this may be the lesser of two evils.

The question arises as to why more positivist economic and technical arguments are used instead of a normative human security discourse. It is reasonable to assume that these arguments are used in order to gain attention at the policy level and to demonstrate that civil society is knowledgeable on the issues and can present an alternative expertise to those offered by hydropower companies and IFIs. Indeed, the technical and economic arguments by no means demonstrate bias in their views, apart from the bias that human issues should come before economic interests. Reports take the available information from the NTPC, ADB and World Bank, analyse it and draw their own conclusions based on their own independent research

⁶⁸⁶ International Rivers in particular have provided a conduit for many of the technical reports used to inform this thesis. See: Blake, "Review of the NT2 EAMP"; Blake, "Adequacy of Compensation Measures XBF"; Lanza, "Review of the Water Quality Assessment NT2"; Theiss, "Reservoir Fisheries Predictions NT2"; Willing and Knoop, "Review of EAMP".

⁶⁸⁷ Chuenchom Sangarasri Greacen and Chris Greacen, "An Alternative Power Development Plan for Thailand," December 2, 2011: <http://www.internationalrivers.org/resources/an-alternative-power-development-plan-for-thailand-2446>; "WWF Position Statement."

⁶⁸⁸ Gráinne Ryder, "Ten Reasons Why the World Bank Should Not Finance the Nam Theun 2 Power Company in Lao PDR," (Toronto: Probe International, June 2004).

⁶⁸⁹ "Nam Theun 2 Hydropower Project: Risky Business for Laos," (Berkeley: International Rivers, 15 June, 2008).

⁶⁹⁰ "Possible to Have Same Power with Less Damage with Alternative Mekong Dams," WWF, April 18, 2011: <http://wwf.panda.org/?200046/Possible-to-have-same-power-with-less-damage-with-alternative-Mekong-dams>.

and the wider academic knowledge on the subject. Yet the efficacy of this approach is questionable.

Rather than carving out a separate space in which human security is valued in and of itself in terms of human needs, rights and values, this approach appears to play into the hands of the national security discourse, particularly the economic imperative argument as explored in the previous chapter. This nationalistic argument revolves around the collective good versus the individual good, or the national versus the local, suggesting that individual and local sacrifices must be made in order to further national development.⁶⁹¹ As Mitchell has argued, however, “the discourse of what is ‘local interest’ (by implication parochial) and what is ‘national interest’ (by implication public good) is itself part of the politics of legitimation that reflect dominant power structures”⁶⁹². The NTPC and GoL’s claims of the adequacy of compensation measures to villagers of the Nakai Plateau and the XBF is part of this economic legitimisation. Arguments against the adequacy of compensation – that argue from a technical and economic perspective – risk playing a role in legitimising the economic argument.

The challenge for NGOs in this sense is the almost total absence of human security discourse related to hydropower at the national and regional levels that they can engage with. From a national perspective, and with the lessons of the previous chapter in mind, it is unsurprising that MRB riparians have no interest in the issue of human security. While this does not preclude other civil society organisations from pursuing the human security agenda, there is yet little to speak of. For example, the Council for Security Cooperation in the Asia-Pacific (CSCAP) is an ASEAN track two organisation designed “to contribute to the efforts towards regional confidence building and enhancing regional security through dialogues, consultation and cooperation”⁶⁹³. Although it is intended “to provide an informal mechanism by which political and security issues can be discussed by scholars, officials, and others in

⁶⁹¹ Brendan Howe and Kearnin Sims, "Human Security and Development in the Lao PDR," *Asian Survey* 51, no. 2 (2011); Jared Ferrie, "Laos Turns to Hydropower to be 'Asia's Battery'," *The Christian Science Monitor*, July 2, 2010: <http://www.csmonitor.com/World/Asia-Pacific/2010/0702/Laos-turns-to-hydropower-to-be-Asia-s-battery>.

⁶⁹² Michael Mitchell, "The Political Economy of Mekong Basin Development," in *The Politics of Environment in Southeast Asia: Resources and Resistance*, ed. Philip Hirsch and Carol Warren (New York: Routledge, 2002), 87.

⁶⁹³ "About Us," CSCAP, 2008: <http://www.cscap.org/index.php?page=about-us>.

their private capacities”,⁶⁹⁴ the issue of human security barely rates a mention. In its recent study group of *Water Resources Security in Mainland Southeast Asia*, the issues of hydropower construction and the negative impacts on individuals and communities was raised.⁶⁹⁵ Representatives from Laos and China were the focus of sustained attention in regards to Mekong mainstream dams. When the issue of negative human security outcomes from hydropower construction was raised and the argument became heated, the chair of the meeting reminded participants that they must follow “the ASEAN Way” of non-interference in other country’s internal affairs, peaceful settlement of disputes, and consensus decision-making.⁶⁹⁶ The implication of this is that issues that may be controversial or potentially confrontational, such as human security issues related to hydropower, are effectively taken off the negotiating table.

Evidence of this side-stepping of the issue abounds. The Greater Mekong Subregion (GMS) – discussed in the previous chapter – demonstrated the way that human security and environmental issues are swept aside in the name of development. The Mekong River Commission (MRC), which does not have an economic imperative, nevertheless demonstrates its adoption of the ASEAN Way. This chapter and the one preceding it clearly demonstrate the issues at stake for the greater MRB and its people due to hydropower construction. Yet in the MRC’s latest iteration of its online presence, the tensions over hydropower, and their current and assessed impact on the people of the MRB, are completely absent.⁶⁹⁷ Although the importance of fisheries to the basin’s population is highlighted, hydropower is not mentioned in the “Threats to Fisheries” section, even though the continued construction of hydropower dams is the largest threat to fisheries across the entire basin.⁶⁹⁸ On another front, the negative impact of hydropower on human populations is also notably absent from the

⁶⁹⁴ "CSCAP Charter," *CSCAP*, 2008: <http://www.cscap.org/index.php?page=cscap-charter>.

⁶⁹⁵ "Water Resources Security in Mainland Southeast Asia," *CSCAP*, 2014: <http://www.cscap.org/index.php?page=water-resources-security-in-mainland-southeast-asia>.

⁶⁹⁶ Author interview, Thai CSCAP Representative, Bangkok, Thailand (April, 2012). For the “ASEAN Way” see: William J. Jones, "Universalizing Human Rights The ASEAN Way," *International Journal of Social Sciences* 3(2014); Goh, "Developing the Mekong," 12.

⁶⁹⁷ "Sustainable Hydropower," *Mekong River Commission*, 2014: <http://www.mrcmekong.org/topics/sustainable-hydropower/>.

⁶⁹⁸ "Fisheries."

ASEAN Intergovernmental Commission on Human Rights – an institution that one would expect would have serious concerns for such outcomes.⁶⁹⁹

Furthermore, there is no reference to human security in the ASEAN Charter and, unsurprisingly, the ASEAN secretariat itself avoids these issues.⁷⁰⁰ Its Lower Mekong Initiative (LMI) divides its attention between ‘six pillars’ focused on: agriculture and food security; connectivity; education; energy security; environment and water; and health.⁷⁰¹ It is worth pointing out the artificial separation of these issues that are in fact inextricably linked; food, agriculture, environment, water and energy security are all part and parcel of the same thing in the Mekong – and all have an impact on health. The economic imperative once again comes to the foreground given that the “goal of the (environment and water) pillar is to advance economic growth and sustainable development through transnational policy”⁷⁰².

Essentially, there is no regional discourse on the matter of human security in the MRB generally and Laos more specifically in relation to hydropower. As Elliot has observed: “The primary security problematic remains one that focuses on the maintenance of regional order and stability and the protection (or securing) of those values that are associated with statehood”⁷⁰³. As a result of this and the ASEAN Way, “resistance to ‘human security’ arises because of concerns that it will open a Pandora’s Box of human rights issues, or authorize commentary on the internal affairs of countries in the region”⁷⁰⁴. It would appear, therefore, that the ASEAN Way and human security are incompatible in many important ways – especially through the lens of hydropower development in the Mekong.⁷⁰⁵

⁶⁹⁹ "ASEAN Intergovernmental Commission on Human Rights (AICHR)," *AICHR*, 2015: <http://aichr.org/category/activities/>. One expert interviewee confessed that he has “absolutely no faith in the Human Rights Commissioner of ASEAN” when asked about the links between hydropower and human rights: Author interview, Academic, Chulalongkorn University, Bangkok, Thailand (September, 2011).

⁷⁰⁰ Yukiko Nishikawa, "Human Security in Southeast Asia: Viable Solution or Empty Slogan?," *Security Dialogue* 40, no. 2 (2009): 228.

⁷⁰¹ "Seventh Ministerial Meeting of the Lower Mekong Initiative Joint Statement " *ASEAN*, 2014: <http://www.asean.org/news/asean-statement-communicues/item/seventh-ministerial-meeting-of-the-lower-mekong-initiative-joint-statement>.

⁷⁰² "Sixth Ministerial Meeting of the Lower Mekong Initiative: Joint Ministerial Statement," (Jakarta: ASEAN, 1 July, 2013).

⁷⁰³ Elliot, "Harm and Emancipation," 146.

⁷⁰⁴ Elliot, "Harm and Emancipation," 148. See also: Allan Layug, "Bringing the Individual Back In: A Normative Argument for Human Security," *Journal of Human Security* 4, no. 2 (2008): 65.

⁷⁰⁵ Nishikawa, "Human Security in Southeast Asia."; Jones, "Universalizing Human Rights The ASEAN Way," 83.

Conclusion: Human Security and the NT2

This chapter has focused on the human security aspects of environmental security. In contrast to the macro approach of the previous chapter, it has taken a micro approach, examining a single hydropower project, the NT2 in Laos. It has demonstrated that at the micro-level, the construction of hydropower projects creates significant human security concerns – even when mitigation measures are of a high standard with multiple layers of accountability built in. The most serious issues are those downstream of the dam, due to both the much larger population affected as well as the magnitude of the changes. Far from being a panacea for the negative impacts of hydropower development, the mitigation measures for livelihood options that were adopted by the NTPC at the behest of IFIs have had mixed outcomes at best.

The outcomes are disheartening from a human security perspective because this is essentially a best case scenario of a ‘model dam’. The majority of dams in the region have limited resettlement programs and very little, if anything, by way of livelihood programs – let alone the checks and balances that the NTPC has submitted to as part of the construction and operation of the dam.⁷⁰⁶ The next chapter will consider the broader implications of the findings of this chapter and how these interact with the macro perspective of the Lancang Cascade explored in the previous chapter. The links between state security and human security perspectives through the lens of the environment will be explored, with particular reference to hydropower construction in the MRB. These considerations will bring a more detailed understanding of both Systemic Environmental Security and its potential contribution to security literature more generally.

⁷⁰⁶ The most comprehensive overview of this issue can be found in: Lawrence, "Power Surge".

Chapter Six: Deploying Systemic Environmental Security – Case Study Findings

Economic advance is not the same thing as human progress.

John Clapham: *A Concise Economic History of Britain*.⁷⁰⁷

Introduction

The previous two chapters provided a macro and a micro view of the effects of hydropower in the Mekong River Basin (MRB). The main purpose of this chapter is to understand and analyse the findings of the case study section from the perspective of Systemic Environmental Security. The first section will initially review Chapter's Four and Five in order to distil the main positions of both traditional and human security in regards to hydropower construction in the Mekong. Following this, the other two leading environmental security paradigms – the Environmental Scarcities and Violent Conflict (ESVC) framework, and critical ecology – will be used to focus on the case study material in order to discover what insights they bring to the case. Section Two will explore what unique perspectives Systemic Environmental Security provides to the case study of the Mekong. This analysis will be split into two, initially focusing on the macro and the Lancang Cascade, and then the micro and the Nam Theun 2 (NT2) hydropower dam. Finally, the two case-study chapters will be drawn together to understand them in the context of the whole. That is to say, we must return to seeing the MRB as a single, interactive, complex system. From this position, we are able to grasp the widespread impacts of hydropower throughout the region and come to some understanding of the challenges facing Mekong citizens.

⁷⁰⁷ John Clapham, *A Concise Economic History of Britain: From the earliest times to 1750* (Cambridge: Cambridge University Press, 1949).

Section 1: Mekong Hydropower and Security Perspectives

The case study chapters were designed to demonstrate both ends of the security spectrum in the MRB. The first chapter focused on the Lancang Cascade and provided an opportunity to investigate the traditional approaches to security related to hydropower. The second chapter focused on the NT2 dam and its more localised impacts on human security. This section briefly summarises the findings of the case study chapters, firstly in relation to traditional security, and secondly in relation to human security. After this, some important contributions from both the ESVC framework and critical ecology will be highlighted in order link the chapter more strongly with the environmental security discourse.

Traditional Security

Chapter four initially outlined the considerable and harmful environmental impacts from the construction of the Lancang Cascade. It demonstrated that there are serious, economic, social, and environmental consequences as a result of the Chinese dams. Irregular water flows, silt capture, disruption to fisheries and changes in water quality are the most significant concerns, and these effects are felt as far south as the Vietnam Delta and Tonle Sap. Although there is a large body of scientific evidence demonstrating these ecological changes, the current traditional security analyses of the situation fail to grasp the nature of the security issues in the MRB.

It is clear that at the local level there is a great deal of consternation about the impacts of the Chinese dams. Locals in Thailand and in Vietnam have expressed ongoing concerns about the impacts on local economies and livelihoods. Local media has given voice to these concerns and the blame is usually placed squarely on China. On the back of these concerns international commentators have raised the prospect of violent conflict over the Lancang Cascade. Realist analyses usually revolve around China's rise, whether it is peaceful or revisionist, and how its regional hegemonic status plays a role in the control of resources. Great power politics are also a factor to some degree, with the Lancang Cascade appearing in the mix of discourse relevant to the US 'pivot' to Asia. On closer inspection however, environmental concerns fade well into the background in these realist analyses. At

the forefront are political machinations, and the environmental challenges in the MRB awkwardly support a realist world view.

What we find when we look more carefully is that all Mekong riparians are involved in the capture of the hydropower resources of the Mekong and its tributaries. This is driven by the other traditional security paradigm of liberal institutionalism which fosters economic integration and cooperation. As the latter part of Chapter Four demonstrates, this cooperation only goes so far in that it revolves around economic, rather than environmental and human security. The two main institutions tasked with enhancing cooperation in the Mekong, the Mekong River Commission (MRC) and the Greater Mekong Subregion (GMS), are far from equal in their effectiveness. The “toothless tiger” of the MRC struggles to draw attention to the negative environmental impacts of hydropower construction. It has only an informational mandate and although it has produced a raft of reports outlining the long-term negative impacts of hydropower on the environment and the people of the Mekong, it is effectively sidelined in favour of the economic benefits to be gained from GMS cooperation.

The GMS, on the other hand, and its economic priorities find widespread popularity and support throughout the region. What we find then, is that there are essentially no traditional security concerns in regards to hydropower construction in the MRB. Deeper investigation indicates a low likelihood of conflict between states over hydropower, and the growing economic integration and combined exploitation of the Mekong’s hydropower potential is apparently ameliorating the political differences between Mekong riparians. The strengthening of economic ties and greater economic development in a region that has been war-torn and economically backward for decades is no doubt a welcome idea. Yet, when we give context to Chapter Four by considering the implications of Chapter Five, what Chapter Four demonstrates is that the two dominant security paradigms in the MRB – realism and institutional liberalism – fail to come to terms in any meaningful way with the immediate and growing problem of the degradation of human security that is arising due to the negative environmental impacts of hydropower construction. Individuals and communities are effectively invisible within the traditional discourse. Chapter

Five demonstrates, however, that there is much more to the story, and that these traditional views greatly limit the discussion and our understanding of security.

Human security

Chapter Five provides an opportunity to examine the human security aspects of hydropower construction in the MRB from a micro perspective. The science and hydrological data in Chapter Five are in many ways similar to that of Chapter Four. However, they enable a better understanding of how these impact particular communities and individuals at a more local level. The impacts of the NT2 have been felt both upstream of the dam around the Nakai Plateau, and downstream of the dam around the Xe Bang Fai (XBF).

When examined from a human security perspective it is clear that the ability of people to satisfy their most basic health needs through access to nutritious food, clean air and water, and shelter have been compromised as a result of the building of the NT2. This means the most basic fundamentals of human security are being undermined. If we extend our understanding of human security to incorporate ideas described by Barnett and others, we find that the construction of the NT2 and its deleterious effects have increased vulnerability and decreased resilience for the people impacted by the dam. Their options have been severely limited in terms of being able to adapt in ways that suit them best.

International and local NGOs are involved in challenging the claims made by the NTPC, World Bank and Asian Development Bank that the development of the NT2 has been fairly compensated and is a win for Laotians in general. They highlight the destruction of livelihoods and the changes to the local ecosystem, but tend to base their arguments around positivist and economic claims. This is somewhat surprising given the broad human security and human rights literature from which they can possibly draw in order to make more normative claims.

Yet on closer inspection, apart from the work of NGOs, it appears that there is an almost total absence of human security discourse in regards to hydropower construction in Southeast Asia. Although it would seem appropriate to discuss the importance of human security and hydropower in a variety of settings – given the scale of hydropower and its impacts throughout the region – no such discursive

framework is evident. A range of possible forums for such a discussion exist in Southeast Asia such as ASEAN, the ARF, the ADB, CSCAP, the MRC, the ASEAN Intergovernmental Commission on Human Rights (AICHR), and possibly even the GMS, yet even though the stakes appear so high and the numbers of people likely to be impacted by Mekong mainstream dams run into the millions, there is no evidence of a formal discussion of the relationship between human security and hydropower.

Furthermore, the 'ASEAN Way' effectively precludes any discussion of human security because the negative human security outcomes are either due to the activities of one nation affecting the citizens of another nation – such as the Lancang Cascade, or an activity in one nation impacting upon its own citizens – for example the NT2. As a result of the ASEAN Way, hydropower construction is seen as a national economic activity. It is therefore not the right of one nation to question the activities of another given the principles of non-interference, peaceful settlement of disputes, and consensus decision-making.

The first important finding in regards to security, the environment and hydropower dams in the MRB is that the relationship between traditional security and human security can be framed as the total dominance of one over the other. A series of structures including the ASEAN Way, the supremacy of the national security mindset, and the importance placed on the economic imperative of development, mean that individuals and communities are almost invisible at a political level. Despite there being abundant evidence of an evolving human security disaster as a result of hydropower construction in the MRB, there appears to be virtually no room for human security discourse.

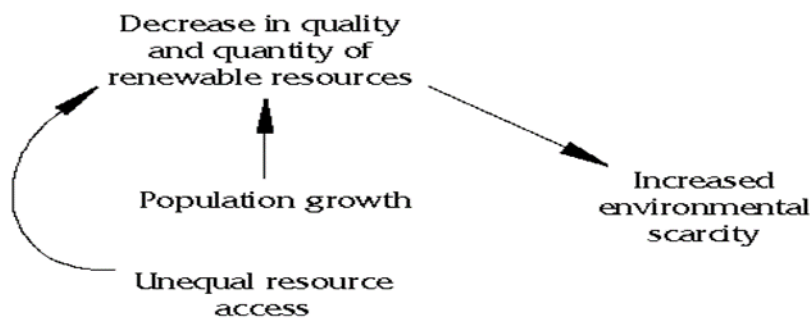
Homer-Dixon's Methodological Framework

Clearly the current understanding of the situation in regards to environmental security and Mekong hydropower is unsatisfactory. Given that Homer-Dixon's framework focuses on the security implications of falls in the quality and quantity of renewable resources such as water, soil, fish and forests, it would be remiss of this thesis not to consider what insights it may provide. When discussing various types of environmental scarcity, Homer Dixon found two common patterns, "resource capture" and "ecological marginalisation":

A fall in the quality and quantity of resources can combine with population growth to encourage powerful groups within society to shift resource distribution in their favour. This can produce dire environmental scarcity for poorer and weaker groups whose claims to resources are opposed by these powerful elites. I call this type of interaction 'resource capture.' Unequal resource access can combine with population growth to cause migrations to regions that are ecologically fragile, such as upland slopes, areas at risk of desertification, and tropical rainforests. High population densities in these areas, combined with a lack of knowledge and capital to protect local resources, causes severe environmental damage and chronic poverty. This process is often called 'ecological marginalization.'⁷⁰⁸



Resource Capture: Resource depletion and population growth cause unequal resource access.



Ecological Marginalization: Unequal resource access and population growth cause resource degradation and depletion.

Figure 21: Homer-Dixon's Resource Capture and Ecological Marginalization

If we consider these ideas in relation to the NT2, we can see that the Government of Laos (GoL) in association with the NTPC, has captured the resource of the Nam Theun River, and destroyed the ecosystem of the XBF, creating environmental scarcity for those who live in the XBF Basin. Losses have occurred in fisheries,

⁷⁰⁸ Homer-Dixon, "Environmental Scarcities," 10-11.

agricultural productivity and water quality. Upstream, citizens of the Nakai Plateau have been forced to move into what are ecologically fragile areas, unsuitable for agriculture which are having even more pressure put on them from continued population growth. The lack of knowledge and capital required to protect local resources has caused severe environmental damage to the surrounding conservation area, especially in terms of forestry, and this threatens chronic poverty through the lack of sustainable livelihoods.

In relation to Mekong mainstream dams, the construction of dams is no doubt a form of resource capture. Both the waters and the sediment of the Mekong are being captured behind the many dam walls that have been and are currently being erected. The resource capture of the Mekong's silt is a considerable challenge. This is particularly problematic for the Delta, in terms of its natural fertility as well as the potential increase in apparent sea-level rise. There is no doubt that this will have long term consequences on the productivity and habitability of the Delta and Tonle Sap, but these impacts are difficult to quantify and almost impossible to separate out from other ecological disruptions with local causes.

Clearly there are synergies between Homer Dixon's framework and the consequences of the construction of hydropower dams. There are two serious challenges, however. The first is that in Homer-Dixon's model, resource capture and ecological marginalisation occur after a fall in the quality and quantity of a renewable resource – that is to say, after resource scarcity has occurred. The challenge here is that – in Laos at least – water is not a scarce resource. In fact it is the abundance of water that appears to be motivating Laotian elites and resource companies to capture this valuable resource and transform it into energy. This is why de Soysa counter's the 'resource scarcity' thesis with the 'resource abundance' theory.⁷⁰⁹ He claims that it is resource abundance that is at the heart of most conflicts over resources. As Deligiannis points out, however, "(t)his is a false dichotomy"⁷¹⁰. It is the fact that resources are scarce elsewhere that creates the demand for the

⁷⁰⁹ Indra de Soysa, "Paradise is a Bazaar? Greed, creed, and governance in civil war, 1989-99," *Journal of Peace Research* 39, no. 4 (2002); Soysa, "Ecoviolence: Shrinking Pie, or Honey Pot?."

⁷¹⁰ Tom Deligiannis, "The Evolution of Qualitative Environment-Conflict Research: Moving Towards Consensus," in *Environmental Security: Approaches and Issues*, ed. Rita Floyd and Richard A. Matthew (New York: Routledge, 2013), 51-52. It is important to note that de Soysa's argument in regards to the resource curse was primarily related to non-renewable 'lootable' resources.

abundant resources. In the case of the MRB, it is the growing demand for energy, particularly in China and Vietnam that is driving the all-out push to capture the hydro-resources of the Mekong. So despite de Soysa's 'honey-pot' assertions, the theory of resource scarcity appears to have some validity in the MRB.

The most obvious problem for Homer-Dixon's environmental scarcity and violent conflict (ESVC) framework as far as the MRB is concerned, is the absence of violent conflict. This was pointed out in the methodology section of this thesis, highlighting that in regards to the ESVC framework, the case of the Mekong is a negative one. As the evidence above suggests, there are strong links between Homer-Dixon's theory of resource scarcity, resource capture and ecological marginalisation. However, the dependant variable of violent conflict is not evident. In many respects, it is the *lack* of violent conflict in the face of these pressures that makes the case interesting – although this is far from the only important point of investigation. It must be noted that it is possible that the growing ecological and social crisis occurring as a result of the scarcities caused by hydropower construction in the MRB is in fact the precursor to a wave of large-scale migrations, state-instability and civil-strife that may lead to widespread violent conflict.⁷¹¹ If so, the case study of the Mekong will provide some powerful qualitative data for future ESVC researchers. Whether this occurs or not, as it currently stands, there is no violent conflict which leads to the conclusion that we need better ways of understanding the relationship between the environment and security in the MRB.

Dalby and Critical Ecology

Before moving on to examine what light Systemic Environmental Security sheds on our understanding of security in the Mekong, we must also consider the approach of Dalby's critical ecology. In general, Dalby's approach to environmental security is at the macro level and he is particularly interested in how the global economy impacts upon biospherical processes. His theoretical concepts, in particular, the concepts of the Anthropocene and Empire, provide insight into the security situation in the MRB.

Clearly, both hydropower construction in general and, from the point of view of this thesis, hydropower construction in the MRB, are contributing to the global changes that are occurring as part of the Anthropocene. As Dalby suggests, "civilisation does

⁷¹¹ Baker, "Dams, Power and Security".

things to nature in the process of doing things to itself”⁷¹². The massive structures of the Nuozhadu and Xiaowan dams in particular, could be described as terraforming projects given the radical ecological changes that they cause in their immediate surrounds and in distant locations such as the Delta and Tonle Sap. Within a decade, the ecological destruction wrought by the totality of Mekong dams on both the mainstream and its tributaries is likely to disrupt the environmental services of the MRB to such an extent that it will be barely recognisable as the river system that existed before hydropower construction. Instead, it will be a fragmented ecosystem, divided into state allocated boundaries, blocked in scores of places by large infrastructure projects that are built by state and commercial interests, designed to transform water into energy. Seventy-five per cent of the Mekong’s silt will be held behind dam walls and the once flowing river will be reduced to a holding pond in many places. The destruction to the livelihoods of those who have relied on the Mekong’s ecosystem services for generations is difficult to comprehend. As Dalby suggests, living in the Anthropocene means that “we are actively shaping our vulnerabilities”⁷¹³.

To some extent the theory of Empire also applies, in which ecosystem people pay the price for the lifestyles of biosphere people. Globalised production and distribution networks mean that risk and harm is shifted to the periphery (ecosystem people) while the benefits are distributed to the core (biosphere people). In the case of this thesis, the NT2 is a good example of this principle in action. Indicative of this is the fact that only five per cent of the power from the NT2 is distributed to Laos, whereas the remaining ninety-five per cent is sent to Thailand. From the perspective of Empire, the villagers of the Nakai Plateau have been removed from their ancestral homes so that Thai children can charge their iPods. The fisheries of the XBF have been destroyed so that the many neon lights of Bangkok can continue to shine brightly. Furthermore, the profits from the NT2 are not redistributed to villagers from the Nakai Plateau and the XBF who have paid the price in terms of destruction of their livelihoods and permanent disruption to their lives, but are instead dispersed internationally to France, Italy and Thailand. The revenue that stays in Laos is held by the central government and it is clear from both the level of governmental

⁷¹² Dalby, *Environmental Security*, 133.

⁷¹³ Dalby, *Security and Environmental Change*, 156.

corruption and the conditions on the ground around the NT2 affected areas, that even within Laos there is little, if any, fair distribution of the profits of the NT2 to those who have had their vulnerability increased as a result of the dam.

The links between the theme of Empire and the NT2 are further strengthened when we consider that a project such as the NT2 would never be countenanced in Thailand. The social and political ramifications of the disastrous Pak Mun dam are still being felt there, to the extent that the sluice gates of the dam are now opened for four months of the year and there are growing calls for its decommissioning.⁷¹⁴ The strength of civil society in Thailand – in regards to *Thai* hydropower at least – is such that any new hydropower projects within the borders of Thailand are fraught with political risk. Yet Thai hydro companies are not only involved with the NT2, but also the Jinhong and Xayaburi mainstream dams.

An insight into the mindset that drives these actions can be gained by considering Dalby's suggestion that 'environment' is a colonial construction:

Premised on the extraordinary modern assumption that divisions between humanity and the rest of the biosphere are a useful ontological starting point the term environment has come to encompass the definition of the part of 'nature' that provides the backdrop for human affairs.⁷¹⁵

The environment, therefore, is something 'out there' to be controlled and apportioned. In relation to security, this has led to "the traditional focus on control by dividing up the world into spaces that could be policed by actual or threatened violence"⁷¹⁶. In the MRB, it is an unquestioned – and apparently unquestionable – assumption that states not only control their own part of the river, but have the right to do with it as they wish. The ASEAN Way perpetuates and reinforces such a mindset. The GoL's attitude to the waters of the Nam Theun River – and their section of the Mekong mainstream – follows this logic. Water, like coal, is a resource waiting to be transformed into energy and exported for foreign currency. It is simply a matter of turning an external environmental resource into a quantifiable economic return.

⁷¹⁴ Karnjana Karnjanatawe, "River of Dreams," *Bangkok Post* 31 March, 2014.

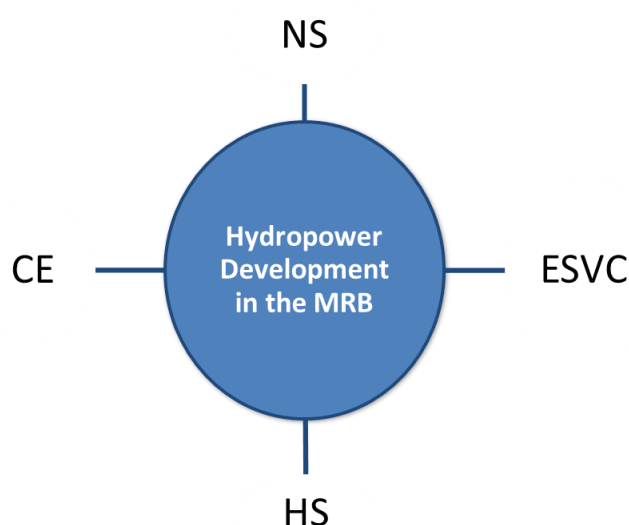
⁷¹⁵ Dalby, "Environmental Security: Ecology or International Relations?," 5.

⁷¹⁶ Dalby, *Security and Environmental Change*, 169.

Dalby's ideas of the Anthropocene and Empire shed light on the national security, state-oriented mindset. This mindset dominates, not only in Laos, but throughout the MRB and it facilitates the state-mandated capture and sale of the natural resources of the Mekong. These actions clearly come with negative human security implications but, once again, individuals and communities appear to be invisible, or at least shrouded by economic priorities. On the other hand, the principle of ecology seems to align itself with human security concerns in the MRB and provides an alternative discourse of hydropower.

Divided Perspectives of Environment and Security in the Mekong

The four perspectives above provide an overview of the way that current security thinking perceives security in relation to hydropower in the MRB. The majority of the traditional security views described in Chapter Four do not attempt to come to grips with the way that the state and the environment interact, nor how negative environmental outcomes may impact on national and economic security in any meaningful way. In Southeast Asia it would appear that traditional security thinking at a policy level is not attempting to incorporate even a basic level of understanding in regards to environmental security. In a similar fashion the human security discourse in the MRB tends not to engage with the more theoretical notions of human security. Nor does it appear to be effective at gaining attention at the policy level in regards to the links between the environment, human security and the state or institutions



(securitisation). In regards to the ESVC framework, there are clearly links surrounding environmental scarcities and resource capture. The obvious problem is that there is an absence of violent conflict, the dependent variable for the model. Finally, the critical ecology approach demonstrates that significant costs of hydropower are being shifted onto the poorest while

Figure 22: ESS Divisions and the MRB

the benefits are being transferred elsewhere.

Each of these views has its own value but when drawn together to analyse a single problem they help to highlight the disparate notion of environmental security studies (ESS) (see figure 22). Understanding the role of states in the capture and exploitation of hydropower in the MRB is clearly important to any security analysis, yet an approach that favours only state security is obviously doing more harm than good. Highlighting the importance of human security to the security environment in the MRB is of crucial importance, yet the issue continues to be ignored at a policy level. The ESVC framework provides valuable insights, yet its focus on violent conflict weakens it conceptually in cases such as the MRB where there is none. Critical ecology provides valuable insights in regards to state attitudes and actions towards the environment and human security. Yet it is unclear how this complex and highly theoretical conceptualisation can have an impact upon policy in a region where policymakers are clearly not engaged with even a basic level of environmental or social theory.

It appears that environmental security has an important role to play in understanding the security environment in the MRB in relation to hydropower development. Unfortunately, the divided nature of ESS hinders a discourse that might be constructive in addressing the growing insecurity that is occurring as a result of hydropower construction. The next section takes steps towards addressing this situation by forwarding SES as a more united way of understanding environmental security.

Section 2: Systemic Environmental Security in the MRB

In order to put forward the argument that Systemic Environmental Security (SES) is a potentially valuable tool for understanding the security issues in the MRB, several things have needed to initially occur. Firstly, Chapter Three outlined the theoretically disparate nature of ESS and posited that a more coherent approach could be gained by conceptualising ESS in a systemic way. Instead of pitching human security against state security, SES proposes that the two are related when viewed through the lens of the environment. Secondly, in order to understand what value SES may have to security studies, Chapters Four and Five provided an empirical context: hydropower development in the MRB. Finally, the section above provided an

overview of what insights the main approaches to ESS afford when analysing the situation in the MRB.

These three accomplishments provide a foundation from which to argue that: a) hydropower development in the MRB is creating – and will increasingly create – a range of security issues; b) due to the splintered nature of ESS and the dominant state-focused mindset in the MRB, environmental security issues are poorly understood, and; c) as a result, a more coherent understanding of the way that the environment interacts with security in relation to hydropower development in the MRB is required. This section therefore explores the unique insights provided by SES in relation to hydropower development in the MRB. The section is broken into two, initially focusing on the macro environment examining the Lancang Cascade. The micro examination will follow this, exploring the relevance of SES to the construction of the NT2.

The Lancang Cascade and Systemic Environmental Security

Security studies often focus on who or what is the referent of security. In Chapter Three it was noted that a Systemic Environmental Security perspective instead investigates the security relationship between the state, the environment and human security. An SES approach is therefore focused on how the various parts of the system impact upon each other to enhance or degrade security and what actions, attitudes and/or policies are appropriate for enhancing security and circumventing insecurity. In regards to the Lancang Cascade therefore, there are three main considerations including: the relationship between states and the environment; the relationships between states and other states; and the relationship between states and human security.

States and the Mekong System

As Chapter Four demonstrated, the driving force behind hydropower development in the MRB is the economic imperative of nation-building underpinned by the dominant security paradigms of realism and liberal institutionalism. This has led to a powerful combination of the principle of non-interference in the affairs and actions of other states with a mentality that views decisions over environmental matters as sovereign. The first consequence of this is that the transboundary, geopolitically connected ecological system of the Mekong River is viewed in reference to national

boundaries, and the exploitation of its resources is encouraged but subject to no oversight or consultation outside of the exploiting state.

This attitude towards the Mekong is typical of state attitudes towards non-renewable resources such as mineral and hydrocarbon deposits. The geographically fixed nature of non-renewable resources means that international norms allow for the exploitation of resources such as oil, gas, coal and diamonds within the confines of a state's borders. This attitude towards non-renewable resources is being applied by nation states (N) to the renewable and trans-boundary environmental resources (ER) of the MRB; resources such as water, silt and fish (see figure 23).

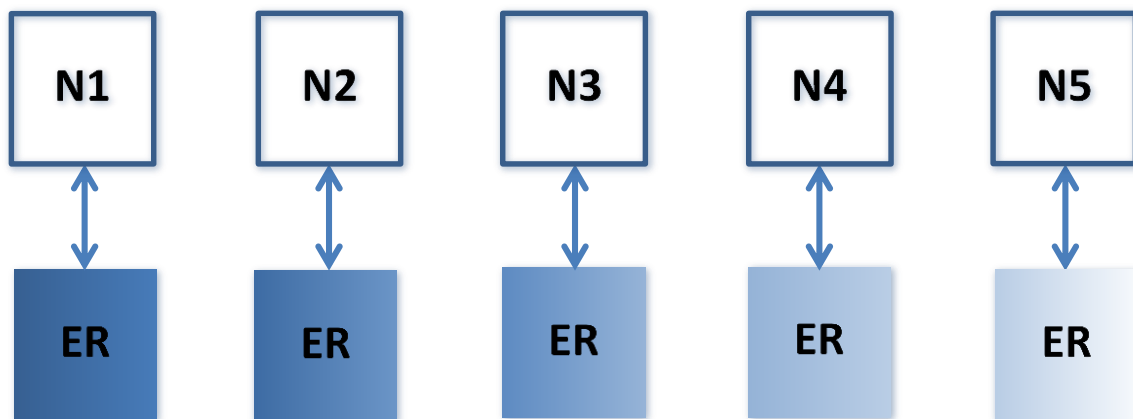


Figure 23: State-based approach towards the environmental resources of the MRB

What SES indicates however is that dividing the Mekong along state boundaries is both artificial and harmful because the MRB is a complex and interconnected ecosystem. The waters of the Mekong River flow from the Tibetan Plateau to the Vietnam Delta. The Delta's silt flows from all of the Mekong's tributaries as well as from the Tibetan Plateau. The many fish species and the multitude of fish in the Mekong and its tributaries often migrate hundreds of kilometres, paying no heed to state boundaries, but relying on the seasonal water flows to trigger spawning. Additionally, agriculture and livelihoods rely on the environmental processes and services of the system. From an SES perspective therefore, it is inappropriate to think of the environmental resources of the Mekong as partitioned and belonging to each state. Instead, the Mekong is a complex and interconnected system that is shared by a number of states who all benefit from it in a variety of ways. These benefits have been enjoyed by millions for millennia *because* it is a complex and

functioning ecosystem. This contradicts economic arguments that hydropower development is a positive outcome. This can only be considered the case if the Mekong is seen as large deposit of water, and that in transforming that water into electricity there are no negative externalities. A systemic view of the Mekong sees it as not only a Chinese water source to service the Lancang Cascade, but also as a source of water, silt, fish, agriculture, transport, subsistence, livelihoods and a foundations for economic activity for the other riparian nations.

The capture of half of the Mekong's silt load by the Lancang Cascade and the changes in water flow that are occurring as a result of the 40 km³ of water withheld by the dams has created a phenomenal strain on the system both immediately and in the long-term. The realist fiction that the resources of the MRB can be divided between and exploited by each individual state (see *figure 23*) was able to continue as long as the activities of one state did not impinge on the activities of another. The Lancang Cascade changed this dynamic by fundamentally changing the system, not only within the borders of China, but as far away as the Vietnamese Delta and the Cambodian Tonle Sap. The dominant national security mindset that resists a rules based governance of the MRB has no way of resolving this issue given the strong position taken that states should not interfere in the affairs of other states.

Systemic Environmental Security and MRB Riparian Relations

The result is that although states downstream of the Lancang Cascade may be unhappy about the effects the dams are having on the river as a whole, they are trapped in a mode of international relations that has no scope for dissent. SES provides an alternative perspective from which to understand the situation. In regards to the shared renewable resources of the Mekong, such as water and silt, where the resource is dynamic – as opposed to static – flowing through the sovereign borders of several nation states, the relationship between the states who share this resource has physical properties. Relationships between states are usually thought of in terms of international relations, trade, tensions, treaties and other non-tangible or ideational ways. These relations are managed through political, business, cultural and personal means. States may share borders and these can be secured by military or para-military forces, or they can be reasonably porous – or anything in between. The physical connection between states is therefore generally understood in terms of a shared border. However, if we think of the MRB as a single

interconnected ecosystem, linked from its source, through its tributaries and main stem all the way to the Delta, then we realise that the connection between Mekong riparians surpasses that of a traditionally understood shared border (see figure 24) Each riparian state is physically linked through the system of the Mekong with the other states in the system.

MRB riparians, therefore, are directly linked – at least on Mekong related issues – through their relationship with the environment. A national security, state-boundary oriented perception of security has hindered the nations that share the resources of the Mekong from recognising that each has an interest in ensuring that the system is healthy and intact. It has also hindered states from recognising that disruption to the environmental services of the system in one state, has knock-on effects in other states. This has implications for the non-interference principle. If states are able to shift their understanding of their relationship to the Mekong from that of Figure 23, to that of Figure 24, then they are able to realise not only that they are connected to their riparian neighbours in a real and meaningful way, but also that severe disruption to one part of the system ultimately leads to disruption in other parts.⁷¹⁷ This means that the overexploitation of the system within the boundaries of one nation-state is effectively a breach of the unwritten rule that states are not to interfere in the affairs of another state.

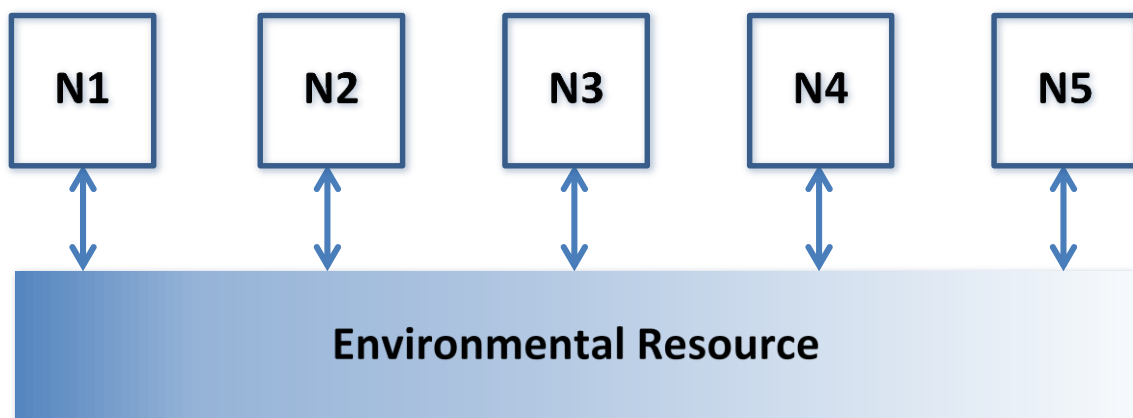


Figure 24: SES perspective of links between Mekong Riparians and the Mekong System

At first glance, this is what Hardin described as a “tragedy of the commons” where a series of actors, all of who have access to a common resource, seek to maximise

⁷¹⁷ Goh, "Developing the Mekong," 57.

their gains from that resource.⁷¹⁸ Hardin describes a group of herdsman who continue to add cattle to their herd in order to maximise the returns from a shared field. This, according to Hardin is a rational act, but the eventual outcome is a tragedy: “Each man is locked into a system that compels him to increase his herd without limit – in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all”⁷¹⁹. This assumption is grounded firmly in a Malthusian logic of diminishing resources in the face of a growing population.⁷²⁰

⁷¹⁸ Garrett Hardin, "The Tragedy of the Commons," *Science* 162, no. 3859 (1968).

⁷¹⁹ Hardin, "The Tragedy of the Commons."

⁷²⁰ See also: Garrett Hardin, "Extensions of" The Tragedy of the Commons", *Science* 280, no. 5364 (1998).

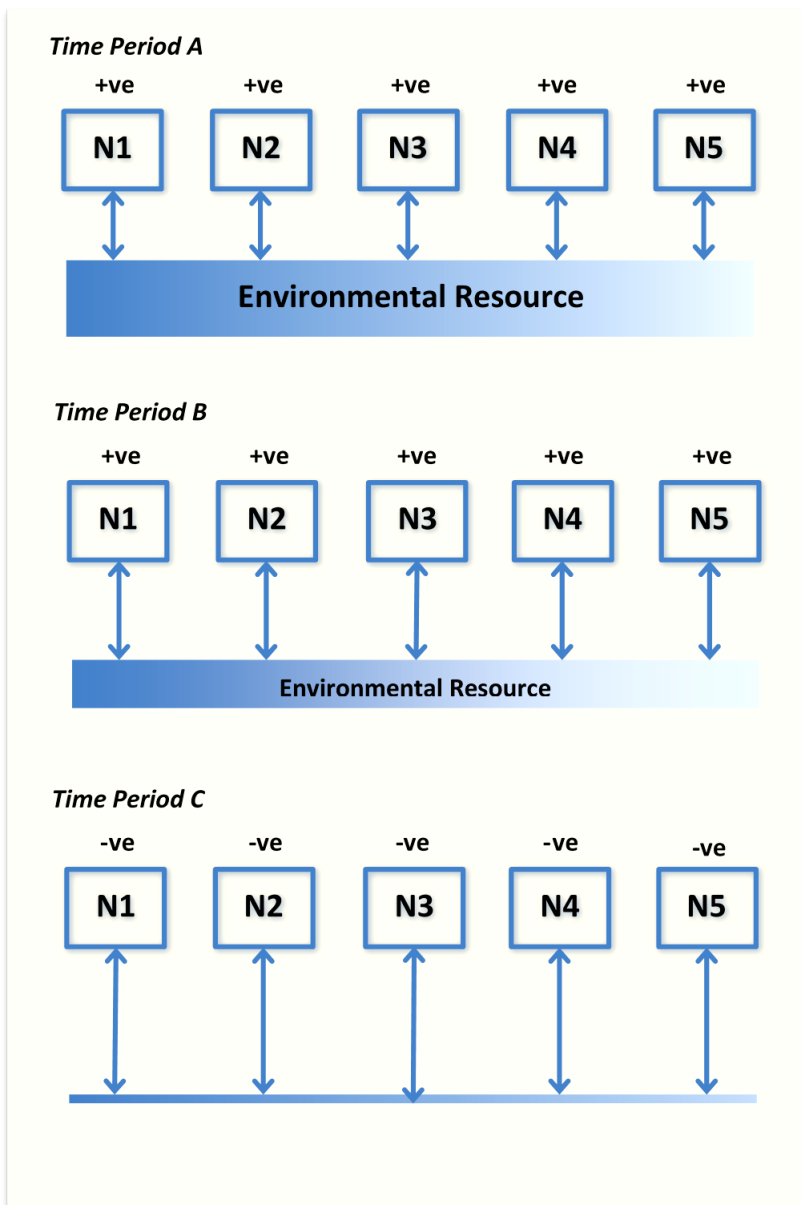


Figure 25: "Tragedy of the Commons" - Collapse of environmental resources over time

Applying this logic to the Mekong's resources we would observe that the MRB riparian states draw down the resources of the Mekong, maximising their own gains, until the point at which the resource or resources collapse (see figure 25).

Growing populations would mean that the pressure on fisheries, for example, would see increased catches occurring even as the stock declines until the point at which the fishery or fisheries throughout the basin collapse. In general, however, this has not been the case, and the abundant fisheries of the Mekong have, over a long

period, been self-managed by those who live on and around the Mekong's waters.⁷²¹ When fisheries have collapsed, it has almost always been in relation to the construction of hydropower projects.⁷²²

But Systemic Environmental Security gives a clearer insight into this issue in regards to the complexity of a transboundary ecosystem like the Mekong. We know that the benefits and risks of the exploitation of the resources of the Mekong are unevenly distributed over the length of the river. What we have in reality looks more like *figure 26* because the Lancang Cascade creates non-linear impacts on the system of the Mekong.

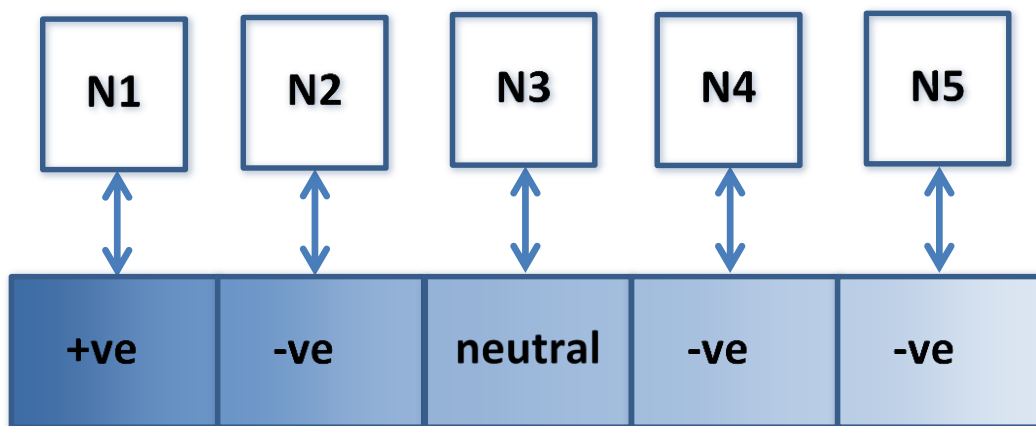


Figure 26: SES perspective on impacts of the Lancang Cascade

It is not a matter of all actors seeking to maximise their own gains, but instead a single actor withdrawing inequitably from and putting great pressure on the larger ecosystem of the MRB. This is also not due to overpopulation – as per Hardin – but of industrial enterprise designed to benefit one nation state, doing so at the expense of other nations.

Shifting the perspective from that of *figure 23* to that of *figure 24*, enables national governments to understand more clearly that the Mekong works as a system and is better understood in terms of its ecological processes than through the division of national boundaries. This then enables an understanding that damage or significant changes to the system within the national borders of one state, literally has flow-on

⁷²¹ Ostrom's Game Theory approach to Common Pool Resources demonstrate that this is not an unusual occurrence. See: Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge University Press, 1990).

⁷²² Pak Mun and Yali dams for example.

effects to other parts of the system and other states. An SES perspective contradicts the national security rhetoric that what one nation state does within the confines of its own borders is strictly its own business. In the case of the Mekong generally, and more specific the Lancang Cascade, the national security logic is clearly flawed.

This knowledge leads to the understanding that changes wrought on the system of the Mekong by the Lancang Cascade is not only inequitable, but that it is damaging to other nations in a variety of ways. SES therefore provides an alternative security framework through which MRB riparians can understand mainstream hydropower development. It also provides a discourse that steps outside of the simplistic national security mentality that dominates in the region, making ground for Mekong riparians to take issue with nations whose actions impact upon the system that links them all. In this sense it encourages and enables Mekong riparians to reimagine and rescript their relationships in recognition of their linkages through the Mekong system, which could bolster support for a move towards a more rules based governance system of the Mekong through minor relinquishments of autonomy. In this way, it is not a matter of *either/or* but *all*: security is gained not by one nation securing the resources of the Mekong within the confines of its own borders and at the expense of others, but instead by the careful and shared exploitation (or preservation) of the resources in an equitable fashion between all the Mekong's riparians.

States and Human Security

The section above explored the relationship between states by considering the Mekong as a system, however one of the main concerns of this thesis surrounds the relationship between national or state security and human security through the lens of the environment (*see figure 27*).

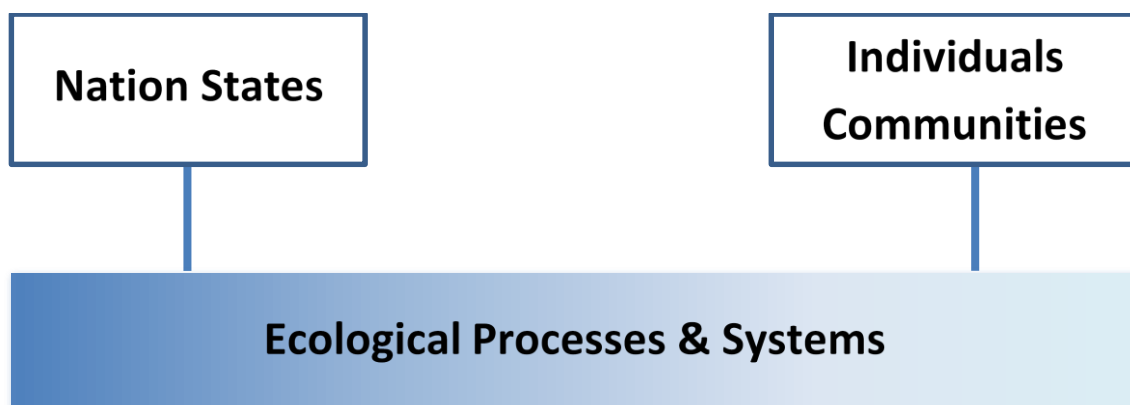


Figure 27: Links between the state, the environment, and human security

The disregard of national and regional policymakers for human security issues, as they relate to hydropower development in the Mekong, and more specifically the Lancang Cascade, indicates that states are either ignorant of, or indifferent to the relationship that exists between the state and human security. This is linked to the national security mindset that fails to conceptualise the relationship between states, the system of the Mekong, and other states. If states believe that what they do within the confines of their national boundaries only affects them, then any human security concerns they *may* have are only in relation to their own citizens within their own borders. Whether these citizens are treated with respect or disdain is up to the state whose actions are impacting on them due to the principle of non-interference.

As observed in the introduction to Chapter Five, given the other pressures currently faced by the Delta and Tonle Sap, it is difficult to pinpoint exactly what role the Lancang Cascade plays in these.⁷²³ What we do know, as has been detailed previously, is that the Lancang Cascade is withholding around ninety per cent of the silt load from the Chinese section of the river. We also know that the silt from China contributes at least fifty per cent of the silt that flows through and into the Delta. We know that this silt is crucial for agriculture as a natural fertiliser, for the height of the Delta relative to sea-level, for the health of the banks and beds of the river and the channels of the delta, and that the health of the banks and beds of the river is also crucial for fisheries. We also know that an enormously large number of people are reliant on the continuing services of the river for subsistence, livelihoods and other economic activities (*see figure 28*).

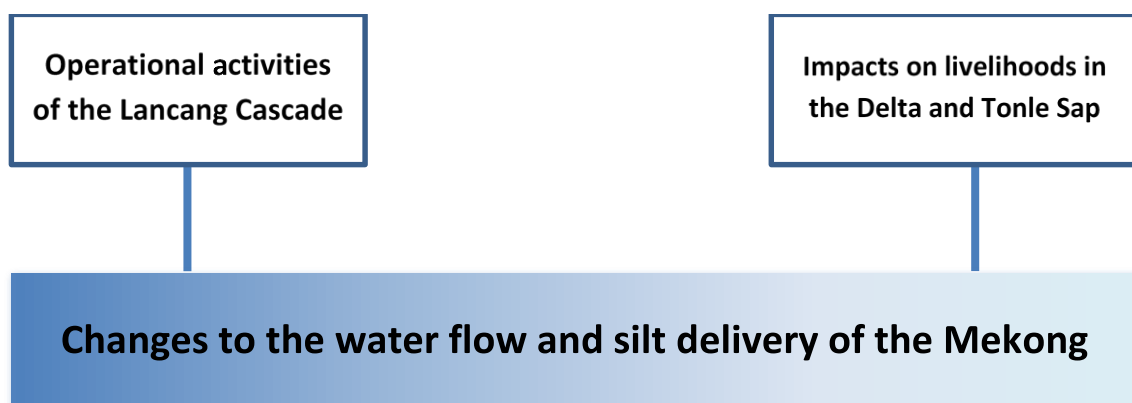


Figure 28: Systemic Environmental Security and the Lancang Cascade

⁷²³ A similar difficulty exists in global climate change debates about the role of climate change in severe weather events. It is known that climate change greatly increases the probability of severe weather events, but for any given event it is difficult to assign direct blame on climate change.

There are obviously links between the activities of Chinese state hydropower developers and the human security outcomes of people in the Delta and Tonle Sap. The Lancang Cascade is having an impact on the delta, but whether these affects are felt immediately or in years to come through decreasing productivity and a sinking delta, only time will tell. If we understand the Mekong as a system, and one that has been in existence for millennia, then whether the impacts are felt now or in the future, it still represents a driver of insecurity. In some ways this is similar to the threat posed by nuclear weapons, which – whether deployed or not – have the potential to destroy the lives of millions. It is somewhat different, however, in that until deployed, nuclear weapons are in most cases only a vague threat. In the case of the Lancang Cascade, the driver of insecurity has already been ‘deployed’ – it is only a matter of time until its impacts are felt.

In a general sense then, SES provides a unique perspective on the relationship between states and human security. It demonstrates that the actions of a state within the confines of its own borders can have a significant negative impact on human security in another state when those actions affect a shared ecological system. How this operates in detail is unclear due to the macro level analysis provided in Chapter Four. It is also complicated by the difficulties that arise when attempting to isolate the impacts of the Lancang Cascade from other elements driving ecological degradation in the Delta and Tonle Sap. For this reason, we must now turn to the NT2 dam which provides a richer source of data on the links between hydropower construction and human security.

The Nam Theun 2 and Systemic Environmental Security

As with the previous section examining SES and the Lancang Cascade, this section is focused on the relationships between states, the environment, and human security. Whereas the previous section focused more significantly on the relationships between states and the environment, and the relationships between Mekong riparians states, this section – with its micro focus on the NT2 – is focused primarily on the actions of one state and its interactions with the environment and the security of its citizens. It is therefore more oriented towards human security. This section is therefore broken into three sections. Firstly it examines the relationship

between the state and the environment. Secondly it reviews the relationship between human security and the environment. Finally it examines the relationship between the state and human security, exploring what perspective SES brings on the intermediary effect of the environment.

The State and the Environment: The GoL's attitude to renewable resources

The NT2 has been constructed in the context of the regional economic imperative of nation building and development as described in Chapter Four. It is, however, just one dam of twenty-three already constructed within the borders of Laos that are radically and rapidly changing the ecological make-up of its abundant waterways.⁷²⁴ The GoL intends to construct or complete another thirty-one projects over the next decade, adding another 5,500 MW of output to the already installed capacity of 3,200 MW. This is a significant development given that the mines and energy sector already attracts seventy per cent of foreign investment in Laos and makes-up seventy-five per cent of all exports.⁷²⁵

The attitude of the GoL to its natural resources is in many ways an extension of the regional mindset that views nature, or the environment, as an external element to be managed and profited from. Water resources in particular are considered a dormant primary resource requiring transformation into energy in order to be exchanged for foreign income. The draft Policy on Sustainable Hydropower Development (PSHD) gives a clearer indication as to the GoL's mindset towards hydropower development: "To achieve socio-economic sustainability, the government views hydropower development as a key export commodity which can also meet domestic electricity needs, contribute to national socio-economic development and national security as well as improve the living conditions of the people"⁷²⁶. This explicitly draws links between hydropower development, economic development and national security. As the Laotian Industry and Commerce Minister, Nam Viyaketh, said in 2010: "If all

⁷²⁴ "Hydropower Major Revenue Earner for the Country" *Vientiane Times*, January 30, 2015: http://www.vientianetimes.org.la/Business/Business_Hydropower.htm.

⁷²⁵ "Hydropower Major Revenue Earner."

⁷²⁶ "Policy for Sustainable Hydropower Development Being Revised," *Vientiane Times*, December 31, 2013: http://www.vientianetimes.org.la/FreeContent/FreeContent_Policy%20for.htm.

sources of energy can be developed, Laos can become the battery of Southeast Asia...We can sell our energy to our neighbours. Laos can be rich"⁷²⁷.

Arguments for hydropower that emanate from a nationalistic and economic mindset are based on the belief that the negative social and environmental aspects of hydropower can be easily compensated for and/or mitigated. This belief is not only in regards to Mekong tributary projects, but even extends to mainstream dams.⁷²⁸ The World Bank's *Economic Analysis of the Environmental and Social Impacts of the Nam Theun 2*, completed in 2005, claimed that "all known potential adverse impacts of the project (to the XBF) will be for the most part if not completely mitigated or compensated for"⁷²⁹. The same report gave a list of six positive impacts to the lives of those impacted on the Nakai Plateau including poverty alleviation, health and education, cultural and ethnic diversity, habitat and biodiversity, medicine and bioprospection, and carbon resequstration. It included only one negative impact: increased population causing pressure on the resources of the plateau.⁷³⁰

An SES perspective indicates that this purely economic mindset misunderstands or ignores the importance of the social and cultural context. It also highlights that this singular economic perspective demonstrates serious ecological ignorance as it grossly underestimates the complexity of the ecological systems that are impacted by hydropower, and the flow-on effects and downward spirals that can occur when resources are stressed or depleted.⁷³¹ Nevertheless, the pre-construction literature by international financial institutions (IFIs) consistently used economic figures that estimated damage and amounts to be compensated for using quantitative methods that failed to capture the way that livelihoods, economy and ecology interact.⁷³² Official GoL rhetoric on hydropower supports this position claiming that following the construction of a hydropower project, "other related sectors benefit with an increase in agriculture, irrigation, fisheries, industry, tourism and general services"⁷³³. This

⁷²⁷ Ferrie, "Laos Turns to Hydropower to be 'Asia's Battery'."

⁷²⁸ "Managing the Mekong – No Longer a Wild, Natural River," *Vientiane Times*, July 31, 2014: http://www.vientianetimes.org.la/sub-new/Environment/Environment_Managing.htm.

⁷²⁹ Laplante, "Economic Analysis of NT2", 85.

⁷³⁰ Laplante, "Economic Analysis of NT2", 49.

⁷³¹ McDowell, Scudder, and Talbot, "21A and 21B PoE Report", B8.

⁷³² See: Laplante, "Economic Analysis of NT2"; ADB, "Summary EIA NT2"; "ADB Technical Assistance"; "Lao People's Democratic Republic: Greater Mekong Subregion Nam Theun 2 Hydroelectric Project – Social Safeguards Monitoring," (Manilla: Asian Development Bank, June 2008).

⁷³³ "Hydropower Major Revenue Earner."

strongly contradicts the evidence presented by the example of the NT2 and a range of other dams. This rhetoric appears to stem from a highly optimistic point of view that fails to factor in worst-case-scenarios where hoped-for mitigations completely fail. As a consequence they also fail to capture the potential costs involved in rehabilitation, compensation, and losses to livelihoods if such worst case scenarios eventuate.

By viewing the system in ecological rather than economic terms, SES is able to grasp not only that the river is a complex ecosystem, but that it also contributes in a variety of ways to the social and economic fabric of the Nakai Plateau and the XBF region. This systemic perspective suggests that the current national security perspective that views the nation's water as a source of income for nation building, misses the importance of the many other benefits of the region's hydro-resources. In failing to understand the importance of these resources, this simplistic economic approach fundamentally misunderstands that the costs of hydropower production are in fact much greater than the best-case modelling consistently portrays.⁷³⁴ Greater awareness of the complex and interactive nature of environmental resources within the region's economy and communities would provide a very different framework in which to assess the relative merits of hydropower construction.

The Construction of the NT2 and the Destruction of Human Security

In the context of the rapid and widespread hydropower construction not only in the Mekong River Basin but across Asia more generally, the implementation of a livelihood adaptation program is both unusual and, from a human security perspective, desirable. What the case of the NT2 demonstrates, however, is that even with the best intentions of the IFIs, and a reasonably well established livelihoods program, the outcomes for those downstream of the dam are still poor. Chapter Five outlined the significant problems associated with both upstream and downstream impacts.

Upstream, around 6,000 people were forced to relocate as a result of the flooding of the Nakai Plateau. The Nam Theun Power Company (NTPC) alongside the World

⁷³⁴ A range of reports demonstrate this clearly in relation to the NT2. See: Blake, "Review of the NT2 EAMP"; Blake, "Adequacy of Compensation Measures XBF"; Theiss, "Reservoir Fisheries Predictions NT2"; Willing and Knoop, "Review of EAMP". It must be kept in mind that these reports refer only the NT2. There is a raft other similar scientific reports related to a range of other hydropower projects across the MRB.

Bank and the Asian Development Bank (ADB) provided compensation and mitigation measures for resettlers including new housing, sanitation, access to water, land for growing crops, irregular payments from the Village Forestry Association (VFA) and limited assistance for livelihood adaptation. These measures have proved useful in part, but there are still serious long-term concerns for resettlers. Many of these problems revolve around food security. Although fisheries initially increased due to the “windfall catch”, they have steadily decreased as competition has continued for this important resource. The amount of allocated land is also a problem with 0.66 ha being allocated per family, without regard to the size of that family, the remoteness of the land, or the quality of the land for food production. Following the infilling of the dam, a mass culling of buffalo occurred decreasing the overall herd on the Plateau by fifty per cent. This had a double effect of impoverishing many resettlers who had previously invested their savings in buffalo. On top of this, the collapse of the VFA, due to unsustainable and illegal forestry practices, and the failure of the limited alternative livelihoods program has meant that the sustainability of livelihoods on the Nakai Plateau is tenuous at best.

The more serious impacts in terms of ecological destruction and numbers affected have occurred downstream on the XBF. The change in flow of the XBF as a result of the diversion of almost the entire flow of the Nam Theun River has eroded riverbanks, destroyed riverbank gardens, decimated fisheries, and damaged irrigation pumps up and down the length of the XBF. The quality of the water has also significantly changed, impacting on potable water, the health of villagers and the quality of crops under irrigation. People’s relationship to the river has also drastically changed with many fearing to go in or near the river due to the risks of skin irritation and being swept away by the rapid flow even in the dry season. Although there has been limited compensation measures, these are clearly inadequate in comparison to the massive ecological changes wrought by the NT2. As a result livelihood options along the XBF have been greatly reduced.

Systemic Environmental Security anticipates these problems. Clearly, it is neither reasonable nor sensible to divert almost the entire flow of one of the Mekong’s tributaries into another of the Mekong’s tributaries and expect anything other than an ecological and social disaster. Nor is it reasonable to expect anything other than the

same result when inundating an ecologically functioning plateau, turning it into a massive reservoir. A systemic perspective sees the many rivers of Laos as having value in a variety of ways. Residents of the Nakai Plateau and XBF have an intimate relationship with the Mekong's tributaries that emanates from the systemic ecological services provided by these rivers. They eat fish caught in the rivers and sell the surplus to gain income; they drink and wash in the water; they use the water for irrigation; they plant crops in the banks during the dry season and sell the surplus at market; they use the rivers for transportation; and they have a unique culture and religion that is attuned to the seasonal ebb and flow of the rivers' waters. For these people, the river is quite literally life.

What clearly does not cross the minds of Laotian policy-makers is that the rivers within its borders are part of a large, interconnected, highly complex, transboundary ecosystem that, when vibrant and healthy, directly support the lives and livelihoods of hundreds of thousands of Laotians and millions of MRB residents with a social, cultural and economic value that is difficult to measure. Nor does it appear that Laotian policy-makers comprehend that, for those who rely on the waters of the Mekong and its tributaries for life and livelihoods, these waters are not an external environment to be tamed, controlled, subdued, and transformed into money. Instead they provide the basics of subsistence and life, underpin livelihoods, and provide the basis for the local economy.

[The GoL and Human Security: A Systemic Environmental Security perspective](#)

There are clear links between the national security mindset of the GoL and Laos' environment. There are also clear links between human security and the ecological processes and services of Laos' many rivers. It is painfully obvious, however, that Lao policymakers either do not understand the way that this links the state to human security –through the impacts of hydropower on the environment – or that they are deliberately ignoring these links. There is no obvious acceptance that what the state does to the environment undermines the official human development logic that justifies the construction of hydropower. Perceiving these issues from the perspective of Systemic Environmental Security, on the other hand, provides a clear and straightforward way of understanding the links between the state, the environment and human security. SES disputes the dominant logic in Laos that links

human security to economic development. Instead, it recognises the importance of local ecological processes and services to human security and, as a consequence, challenges the idea that the construction of hydropower increases the security of the state. Far from securing the state, an SES perspective suggests that both the security and the legitimacy of the state is undermined by the current rapid hydropower development in Laos.

Understanding the way that the GoL views its relationship with human security is the key to understanding how it so significantly misses the links between the environment and the security of its citizens. Its main concerns revolve around poverty alleviation and attempting to move itself off the list of 'least developed countries' (LDCs). One of the key indicators that enable graduation from this list is to increase the average Gross National Income (GNI) per capita.⁷³⁵ GoL rhetoric therefore follows the logic that: a) national economic development is crucial for poverty alleviation; b) hydropower development is good for economic development; therefore c) hydropower development is good for poverty alleviation (*see figure 29*).⁷³⁶ Official rhetoric clearly demonstrates this attitude. For example, national assembly member for Luang Prabang province, Mr Bountham Sengphansiri, said he supported the controversial Xayaburi dam "because he believed it would generate revenue for the country, helping to reduce poverty and fund development efforts"⁷³⁷. This is in line with statements within the GoL's strategic plan to implement a national integrated water resources management (IWRM) regime which claims that hydropower is essential "for the GoL to meet its goal of reducing poverty and ensuring food security"⁷³⁸. Specifically related to the NT2 project, the Lao Department of Energy Policy and Planning states: "The Nam Theun 2 hydropower

⁷³⁵ "Laos: Aiming to leave least developed country list."

⁷³⁶ Jennifer Corinne Veilleux, "Is Dam Development a Mechanism for Human Security? Scale and Perception of the Grand Ethiopian Renaissance Dam on the Blue Nile River in Ethiopia and the Xayaburi Dam on the Mekong River in Laos" (Oregon State University, 2014), 277.

⁷³⁷ "National Assembly Backs Xayaboury Dam," *The National Assembly of the Lao People's Democratic Republic*, 19 May, 2012: http://www.na.gov.la/index.php?option=com_content&view=article&id=618%3Athere-are-no-translations-available0304&catid=64%3Athe-association-of-lao-parliamentarians&Itemid=173&lang=en.

⁷³⁸ "Lao National Indicative Plan (2011-2015) for Implementation of the IWRM-Based Basin Development Strategy," (Vientiane: Lao People's Democratic Republic, December 2012), vi.

project in Lao PDR has improved living standards for families in the area, while providing a \$2 billion revenue stream to fight poverty”⁷³⁹.

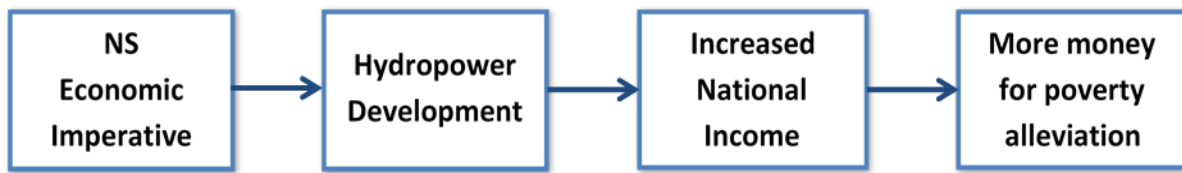


Figure 29: GoL Human Security Improvement Logic

This attitude is supported by development agencies and IFIs who, rather than framing the issue in terms of the negative consequences for human security, frame hydropower construction as contributing to poverty alleviation and development. Documents from IFIs consistently portray the dam as a large win for Laos and its ability to provide better national development and poverty alleviation outcomes.⁷⁴⁰ For example, a 2005 World Bank Technical Brief described the project’s development objective: “to generate revenues that will be used to finance spending on priority poverty reduction and environmental programs in Lao PDR through environmentally and socially sustainable exploitation of NT2’s hydropower potential”⁷⁴¹.

The revenue from the NT2 is by no means insignificant for the GoL, estimated at US\$2 billion over the twenty-five year concession period – worth around twenty per cent of Laos’s annual GDP at the time of construction.⁷⁴² These figures are much more modest when considering that the *annual* contribution to government coffers is around US\$80 million per year.⁷⁴³ Nevertheless, combined with the other seventy hydropower projects that are either operational, planned or under-construction, the hydropower sector is undoubtedly making a significant contribution to the economy of Laos. If we tentatively accept the GoL’s logic that economic development is linked

⁷³⁹ "Lao PDR: Benefits of Hydropower Project Flow to People," *Department of Energy Policy and Planning*, 25 December, 2013: http://www.laoenergy.la/pagelaoEnergyNews.php?id_hotNews=11.

⁷⁴⁰ See for example: Jeff Ball et al., "Review of Nam Theun 2 Hydroelectric Dam, Lao PDR - Final Report to AusAid," (Canberra: AusAid, 21 February, 2005), iv; Robert Anton Mertz et al., "Project Appraisal Document on a Proposed IDA Grant to the Lao People's Democratic Republic for the Nam Theun 2 Hydroelectric Project," (Washington D.C.: The World Bank, March 31, 2005), 6.

⁷⁴¹ Adrian Fozzard, "Technical Brief: Revenue and expenditure management - Nam Theun 2 Hydroelectric Project," (Washington D.C.: The World Bank, March 16, 2005).

⁷⁴² "Lao PDR GDP," *The World Bank*, 2015: <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD/countries/LA?display=graph>.

⁷⁴³ "Project Overview and Description."

to poverty alleviation, then it indeed follows that hydropower development – which is good for economic development – is also good for poverty alleviation and human security.

This logic can only be justified if the focus, rather than being on understanding the root causes of poverty and human insecurity, is instead on raising the economic bottom line. GDP per capita is increasing, from US\$702 in 2007 to US\$1,408 in 2012, and for those that view development in econometric terms, this is a positive.⁷⁴⁴ Unfortunately, GDP per capita – which is an average measure – tells us nothing of the way that national economic gains are either inequitably accumulated or evenly distributed. Although GDP per capita is on the increase, sixty-two per cent of Laotians were still living on less than US\$2 a day in 2012, a drop of only six per cent since 2007.⁷⁴⁵ The average increase in GDP per person does not automatically translate into poverty reduction on the same scale. The increasing number of those involved in the agricultural sector – seventy-seven per cent of all Laotian households – and the steadily decreasing amount that agriculture is contributing to GDP is a clear indication that the benefits of economic growth are not being distributed evenly.⁷⁴⁶

The argument that economic development is the precursor to poverty alleviation falls into a wider debate about whether human development is a prerequisite to human security.⁷⁴⁷ It has been argued that poverty increases the likelihood of conflict and also prevents the attainment of many human security goals associated with ‘freedom from want’ which can only be achieved through a certain level of human development.⁷⁴⁸ With regards to the NT2, Systemic Environmental Security provides a unique perspective in relation to this debate. SES recognises that the ecological services of the Nakai Plateau and XBF underpin the human security needs of those

⁷⁴⁴ "GDP per capita (current US\$) Lao PDR," *The World Bank*, 2015:

<http://data.worldbank.org/indicator/NY.GDP.PCAP.CD/countries/LA?display=graph>.

⁷⁴⁵ "Poverty headcount ratio at \$2 a day (PPP) (% of population) Lao PDR," (Washington D.C.: The World Bank, 2015).

⁷⁴⁶ "Statistical Yearbook 2011", 31; "Lao Census Highlights", ix; "Agriculture, value added (% of GDP) Lao PDR," *The World Bank*, 2015: <http://data.worldbank.org/indicator/NV.AGR.TOTL.ZS/countries/LA?display=graph>. See also: Lars Sondergaard, "Lao Development Report 2014: Expanding Productive Employment for Broad-based Growth," (Washington D.C.: The World Bank, October 2014), 11.

⁷⁴⁷ Shahrbanou Tadjbakhsh and Anuradha M. Chenoy, *Human Security: Concepts and Implications* (New York: Routledge, 2007), 111-16. See also: Amartya Sen, *Development as Freedom* (Oxford University Press, 1999).

⁷⁴⁸ Tadjbakhsh and Chenoy, *Human Security*, 14, 40, 52, 114. Differentiated from the idea of ‘freedom from fear’ which is normally associated with more traditional aspects of state security.

who live in the region. It is an immense contradiction to suggest that the development of hydropower – which severely threatens and undermines the human security of locals – is needed in order to contribute to the poverty alleviation of those same people who are having their poverty increased as a result of hydropower construction. The national development imperative that is, at least on paper, designed to improve the lives of Laotian citizens is in fact destroying their human security (see figure 30).

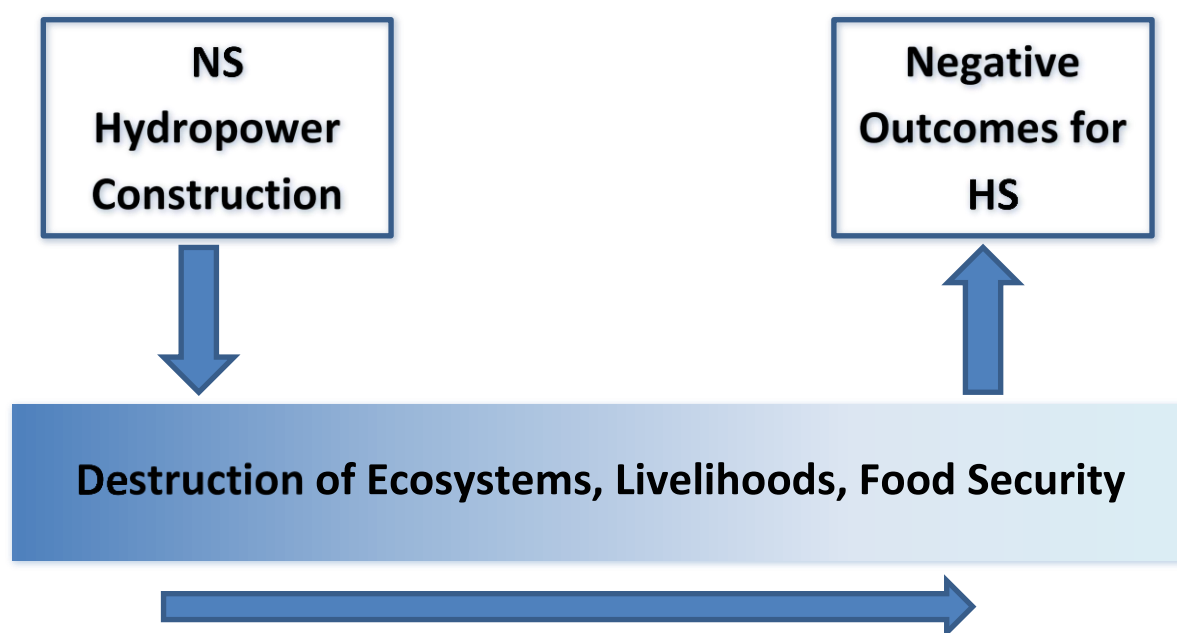


Figure 30: Systemic Environmental Security Perspective of the Relationship between Hydropower Construction and Human Security in Lao PDR

The assumption that poverty alleviation and development come from significant increases in revenue can only be accurate if: a) the activities that lead to revenue increases do not at the same time increase poverty and human insecurity and; b) that the revenue collected from those activities is distributed in an equitable and effective manner in which the majority of Laotians benefit and poverty is in fact alleviated. On the contrary, this rapid hydropower construction may be referred to as “hydro-industrialisation”⁷⁴⁹, but it is clear that it would be inaccurate to couch it in terms of poverty alleviation, human development or security. In regards to poverty alleviation, the long-term prospects on the Nakai Plateau for sustainable livelihoods is bleak and on the XBF, poverty has increased rather than decreased, with villagers

⁷⁴⁹ Goh, "Developing the Mekong," 51.

struggling to come to terms with the destruction of the ecological system that once provided them with their livelihoods.

In regards to human development, hydro-developments – as opposed to other forms of industrialisation such as construction and manufacturing – bring with them few jobs. In the short term they provide some labour roles, but in the long term, very little.⁷⁵⁰ A recently released report from the World Bank found that although hydropower contributed around eighteen per cent of Laos' GDP in 2013, it only provided 22,000 people with employment.⁷⁵¹ As far as employment is concerned therefore, hydropower provides jobs for only 0.3 per cent of the Laotian population.⁷⁵² Furthermore, the rapid hydropower construction is having a negative impact on other sectors such as manufacturing by putting upward pressure on both wages and the exchange rate.⁷⁵³ We must also consider that there is something perverse about using temporary local labour for the construction of hydropower projects. The same labourers are redundant after the project has been completed but have effectively participated in the construction of the source of their future insecurity.

This is why the sustainable livelihoods question is so important – and the NT2 Concession Agreement mentions it a total of thirty-seven times.⁷⁵⁴ If Laos is to alleviate poverty through so-called 'development' such as the NT2, it must at the very least ensure that the livelihoods of those impacted by these developments are not worse off or in jeopardy as a consequence. What is evident, however, is that between 120-150,000 Laotians are, on the whole, worse-off in terms of their livelihood prospects and human security outcomes as a result of the construction of the NT2. The extent of the problems downstream could easily be referred to as a crisis, given the chronic problems that are developing, and this should more accurately be referred to as "de-development".⁷⁵⁵

⁷⁵⁰ McDowell, Scudder, and Talbot, "15th PoE Report", 31.

⁷⁵¹ Sondergaard, "Lao Development Report 2014", 11.

⁷⁵² Based on the 2013 population of 6,769,727. Statistics from: "Population, Total - Lao PDR," *The World Bank Group*, 2015: <http://data.worldbank.org/indicator/SP.POP.TOTL/countries/LA?display=graph>.

⁷⁵³ Sondergaard, "Lao Development Report 2014", 17.

⁷⁵⁴ McDowell, Scudder, and Talbot, "21A and 21B PoE Report", 5.

⁷⁵⁵ Tadjbakhsh and Chenoy, *Human Security*, 117.

Instead of poverty alleviation, development and increasing human security, what is actually occurring as a result of the NT2 is the accumulation of wealth by a relatively few elites within the GoL, leading to a form of resource capture as described by Homer-Dixon. The highly valuable resource of water transformed into hydropower is encouraging the state to capture and sell this resource with little or only token consideration of the problems that it creates for its own citizens. The growing disparity between rich and poor and the continued negative outcomes for rural households during a time of rapid national economic growth is concerning in that the economic growth and wealth production at the core is not making its way to the periphery. In regards to hydropower, this is of particular significance given that it is those in these rural areas who essentially bear the costs of the increasing national income.

As outlined in the previous chapter, corruption is endemic throughout Laos and this is creating growing concerns in relation to the revenue created by the NT2 and other hydropower projects. The World Bank's 2013 update on the progress of the NT2 expressed concerns about how the revenues have been allocated, demonstrating the limitations in the accountability of this process.⁷⁵⁶ A 2014 investigation into corruption in Laos by Global Witness found a gap of US\$150 million in the state coffers in just a two year period – equivalent to almost the entire revenue of the NT2 over the same period.⁷⁵⁷ This is an extraordinary amount of money to be missing from a nation with a GDP of just over US\$11 billion, with an average GDP per capita of US\$1408 and sixty-two per cent of its citizens living on less than US\$2 a day.

Security and the NT2: A Systemic Perspective

The above section demonstrates that the analytical framework of Systemic Environmental Security provides unique and key insights into the security situation in Lao PDR in relation to the construction of hydropower dams. The GoL claims that the construction of hydropower projects is primarily to raise revenue that can be used for poverty alleviation. Official rhetoric from the government and IFIs support this position. This attitude stems from a traditional understanding of security and economy that views the environment as a dormant external source of resources

⁷⁵⁶ "Nam Theun 2 Annual Update 2013", 34.

⁷⁵⁷ Josie Cohen, "Corruption is Allowing Loggers and Land Grabbers to Run Amok in Laos," *Global Witness*, 31 July, 2014: <http://www.globalwitness.org/blog/corruption-is-allowing-loggers-and-land-grabbers-to-run-amok-in-laos/>.

waiting to be captured and transformed into revenue. The state has the ultimate control over the resources within its own borders and the sovereign right to exploit them as it sees fit.

From this position, the state's relationship with human security is one of economic paternalism. It is the role of the state to grow the economy as quickly as possible, gaining the maximum in foreign income from the resources at its disposal in order to distribute this money through poverty alleviation measures. Hydropower, which transforms the abundant water resources of Laos into foreign currency is the perfect candidate for gaining the much needed capital to distribute in this way. This attitude is summarised perfectly by the GoL's Ministry of Energy and Mines, Department of Energy Business: "The Lao Government believes production and exports of hydropower will bring many benefits to the country. Primarily it will boost revenues, which can be used to alleviate poverty and improve the standard of living of the average Lao citizen"⁷⁵⁸. Inconveniences to a purported minority of citizens in this process is unfortunate, but necessary in order to meet the nation's economic goals.

In stark contrast, the perspective of Systemic Environment Security demonstrates that the state's relationship to the environment has a direct impact on the relationship that its citizens have with the environment. In the case of the NT2, and across Laos more generally, a large proportion of Laotians rely on the nation's environmental resources for their subsistence and livelihoods. Hydropower construction has serious negative impacts on the systems that provide these services. SES therefore fundamentally undermines the state's rationale for hydropower construction by linking the activities of the state not with poverty alleviation, but poverty creation. Although hydropower construction may be increasing the revenues of the state, there is little evidence that this money is making its way back to the people affected by hydropower developments.

SES brings to light the inherent contradiction that results from the GoL's continued hydropower development. Using hydropower, which is creating and increasing poverty, as a tool for alleviating poverty is clearly logically unsound. For the GoL's

⁷⁵⁸ "Benefits of Hydropower in Lao PDR," *Ministry of Energy and Mines - Department of Energy Business*, 26 April, 2008: http://www.poweringprogress.org/index.php?option=com_content&view=article&id=52&Itemid=55.

poverty alleviation logic to be effective, it must both focus on the long-term replacement of the livelihoods of those who have lost them due to hydropower construction and provide financial support in perpetuity for those who have been impacted until such time as their livelihood prospects are equal to or greater than what they were before the construction of the dam. The compensation measures attached to the NT2 construction go some way to achieving this but fall far short of what is necessary to mitigate livelihood losses.

A systemic perspective provides a clearer understanding of this situation because it provides greater temporal context to the current hydropower construction on the Mekong and its tributaries. The system itself was in existence millennia before the Westphalian concept of nation states was conceived and has functioned effectively over time to provide subsistence, livelihoods, transport and economy for those who live in the MRB. Previous to the modern adoption of the idea of nation states in continental Southeast Asia, the region was divided into kingdoms and tribes, divided by ethnicity and language groups.⁷⁵⁹ This culturally heterogeneous situation allowed for the flourishing of cultural and economic centres from Luang Prabang in the north to Siem Reap in the south. European settlement changed this to a degree but it was the arrival of Communism and the twentieth century Indochinese wars that solidified the idea of national borders, firmly separating one nation from the other. The most significant challenge in terms of a systemic approach has been the concentration of power over the state in the hands of a small elite.

The case of the NT2 demonstrates that putting state security above the environment and human security, actually undermines the security of the state unless the state is described very narrowly. Only if the state is understood as the central government, and security is understood in terms of national economic growth and wealth creation for government elites, could hydropower construction in Laos be considered to increase security. If the citizens of the country are to be considered part of the state, then the continued narrow focus on transforming the water resources of the nation into hydropower is clearly undermining the security of the state through negative outcomes associated with human security. In regards to national security and human security in Laos, therefore, it is not either/or but both. SES affords this perspective by

⁷⁵⁹ See for example: Milton Osbourne, *Mekong: Turbulent Past, Uncertain Future* (Sydney: Allen & Unwin, 2006); Stuart-Fox, *A History of Laos*.

providing the analytical and conceptual link between state security and human security through the bridge of the environment. By conceptualising the relationship between the state and the environment, and by understanding the relationship between human security and the environment, we are able to understand the relationship between the state and human security in ways that transcend traditional conceptualisations. This is the unique contribution of Systemic Environmental Security.

It is evident that the social contract is broken in Laos. Government actions are harming its own citizens, and creating deep insecurity and vulnerabilities in the name of helping them. The GoL is counting on continued economic growth based on ongoing demand for the energy produced by its hydropower developments. Unfortunately, the evidence suggests that they are not restructuring the Laotian economy to provide jobs and transition the economy towards true sustainable growth.⁷⁶⁰ This makes hydropower development something of a zero-sum game where the costs for these developments are paid for by the loss of ecological services and livelihoods nationwide.

Of greatest concern in relation to this is the over-reliance on the hydropower sector for the security of both the state and its citizens. As more and more hydropower dams are constructed, and more and more ecological destruction occurs, many more Laotians will lose the means of subsistence and their traditional livelihoods. This makes them more reliant on the government and its hydropower revenue. The problem is that if the price of energy drops due to a glut of supply, or economic perturbations occur such as the Asian Financial Crisis of 1997-98 the demand for energy may decrease significantly. There is also the risk that Chinese hydropower production can undercut the price of Laotian energy by a significant margin.⁷⁶¹ If issues such as demand side problems or competition that significantly reduces the profit margin to the GoL, then it will struggle to provide the financial support that is so crucial for its citizens who have lost their livelihoods and means of subsistence. In such an event, instead of being able to rely on the ecological services that have

⁷⁶⁰ Sondergaard, "Lao Development Report 2014"; Christopher G. Baker et al., "Food Security in Asia: A Report for Policymakers," (Sydney: Centre for International Security Studies - The University of Sydney, February 2013); Peter Warr, "The Gregory Thesis Visits the Tropics," *Economic Record* 82, no. 257 (2006).

⁷⁶¹ Goh, "Developing the Mekong," 51-52.

been provided by the rivers of Laos for generations, many Laotians will be doubly vulnerable, from both the destruction of their local ecosystems and the economic losses being faced by their government. This being the case, it is evident that a much more precautionary approach is required when constructing hydropower dams. A great deal more thought must go into the potential negative consequences of hydropower and how this impacts upon the security of Laotian citizens.

The Mekong as a System

Before concluding the chapter it is important to return to the context of the MRB as a whole. As should be abundantly clear in such a study, the MRB is more than its main stem and a tributary. The idea of splitting the case study into a macro and micro view was to firstly facilitate an understanding of the wide ranging impacts of hydropower, and secondly, to understand what the impacts of hydropower construction look like at the level of the village and individual.

These two examples of hydropower development are indicative of the overall situation in the MRB. It also helps us to look forward in time as this understanding gives some idea of what is at stake in regards to Lower Mekong Basin (LMB) mainstream dams. Currently eleven dams are planned for the LMB mainstream and, in combination with the Lancang Cascade, these will withhold a staggering seventy-five per cent of total sediment from the Delta.⁷⁶² Even more controversially, a second cascade is now under construction in the upper reaches of the Lancang River. This will add another 9,765 MW of capacity: close to the combined output of the massive Xiaowan and Nuozhadu Dams. Around 100,000 people will be displaced as a result of both of the Chinese cascades.⁷⁶³ The effect of the Lancang dams and the LMB mainstream dams will be to effectively turn the length of the Mekong into a holding pond for hydropower production.

Then there are the tributaries. The NT2 impacts upon two of the Mekong's tributaries, the Nam Theun and the Xe Bang Fai. As explained in the methodology, the choice to use the NT2 as the micro case was due to the (relatively) large amount of available data. The potential subject matter was abundant, however, with at least

⁷⁶² "MRC Strategic Environmental Assessment (SEA) of Hydropower on the Mekong Mainstream - Final Report," (Hanoi: International Center for Environmental Management, 2010), 78.

⁷⁶³ "Lancang River Dams: Threatening the flow of the Lower Mekong," (Berkeley: International Rivers, August, 2013).

forty-one dams already built or under construction on the tributaries, and an additional thirty-one dams planned over the next two decades.⁷⁶⁴

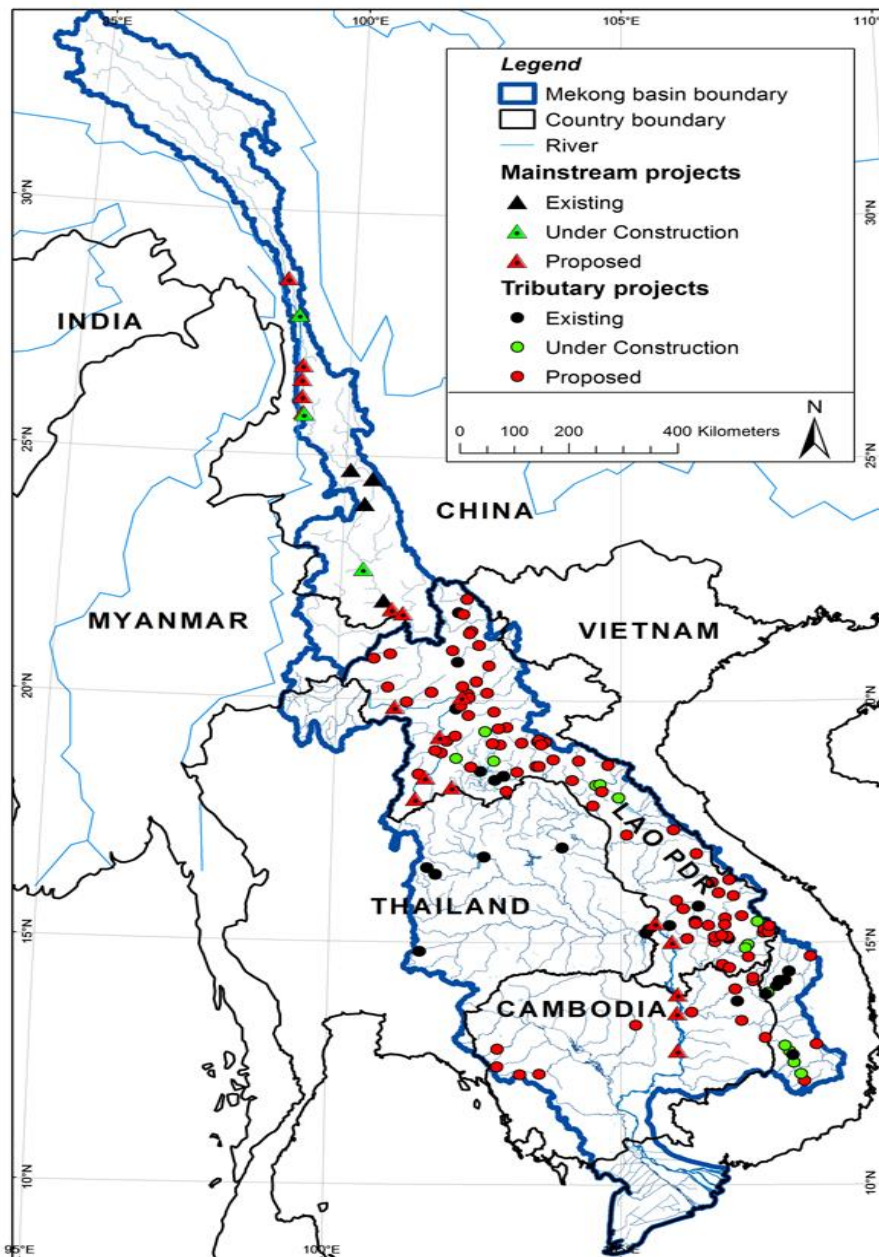


Figure 31: Hydropower Construction in the MRB. Map from: *Mekong Flows, Hydropower, 2010*: <http://mekongriver.info/hydropower>

Several dams have already been mentioned in previous chapters in regards to the severity of their impacts on the livelihoods of villagers, including the Pak Mun and Yali Falls and the dams. A report released by International Rivers in 2008 provided 11 case studies of dams in Laos, detailing the negative impacts of hydropower

⁷⁶⁴ "MRC SEA Final", 44-45. + BDP 24)

projects on at least 590,000 Laotians, nearly 10% of the Laotian population.⁷⁶⁵ Each case details a familiar litany of complaints including fisheries' losses, water quality decreases, food security issues and little, if any, compensation. Since the release of this report, hydropower construction has continued at a rapid rate.

The overall number of individuals and villages affected by hydropower construction in the Mekong is difficult to estimate. The trouble is that Environmental Impact Assessments (EIAs) are often so lacking in detail that it is virtually impossible to determine the downstream impacts. The Xayaburi Dam is a case-in-point. Although it is the first mainstream dam to be constructed, and threatens to block the vital mainstream fish passages, its EIA only assesses impacts of the dam one kilometre downstream and twenty-two kilometres upstream.⁷⁶⁶ This is a severe oversight given what is known about the importance of long distance fish migration on the mainstream and the impacts of withholding silt from the delta.

What we do know is that around sixty million people live in the LMB. Of these, twenty-five million live in a fifteen kilometre corridor on either side of the mainstream and over three-quarters of these live within five kilometres of the river.⁷⁶⁷ This includes seventeen million living in the Delta and at least another 1.7 million on and around the Tonle Sap – the two areas that are known to be most vulnerable from mainstream dam construction.⁷⁶⁸ In regards to the Tonle Sap, forty per cent of Cambodians rely on the lake as a source of subsistence and income, and fish provides seventy-five per cent of protein for rural Cambodians.⁷⁶⁹ In the Delta, over half of all employment is water-resource related and in Laos, seventy per cent of all rural households rely on fishing for their livelihoods. Across the basin, sixty per cent of the population have water related occupations.⁷⁷⁰ In short, the river, its tributaries and the ecosystem services they provide are a vital source of food security and livelihoods for tens of millions. A plethora of reports have demonstrated the negative

⁷⁶⁵ Lawrence, "Power Surge".

⁷⁶⁶ Eric Baran et al., "Review of the fish and fisheries aspects in the feasibility study and the environmental impact assessment of the proposed Xayaburi dam on the Mekong mainstream," in *Report prepared for the WWF Greater Mekong* (Hanoi: WWF, 2011), 13.

⁷⁶⁷ "MRC SOB 2010", 47.

⁷⁶⁸ Marko Keskinen et al., "Exploring Tonle Sap Futures: Baseline results from hydrological and livelihood analyses," (Amsterdam: VU University, 2011), 5.

⁷⁶⁹ "MRC SOB 2010", 49.

⁷⁷⁰ "MRC SOB 2010", 48-49.

impacts that have and will occur to the MRB's ecosystem services as a result of the construction of dams, yet construction continues at a rapid pace.⁷⁷¹ For example, if dam building continues unabated, the "reduced suspended load will have significant implications for the transport of nutrients which naturally fertilize the Tonle Sap system and 23,000 – 28,000 km² of floodplain in Cambodian (sic) and Viet Nam, as well as de-stabilising the river channels, floodplains and coastline of the Mekong Delta".⁷⁷² This has a direct impact on the productivity of fisheries and a knock on effect to the large number of Cambodians and Vietnamese reliant on these areas for their livelihoods and subsistence.

The point here is that the case study chapters are, in effect, a snapshot of the whole system. It is not possible to go into the kind of detail required to list every dam currently in operation – and the individuals and communities that they impact, or every dam that is under construction and planned – and the people they are likely to affect, but it is important to keep in mind the overall context of the large system of the MRB and the large numbers of people that are being impacted in very serious ways by the unwavering construction of hydropower.

Conclusion

This chapter has demonstrated the value of the analytical framework of Systemic Environmental Security by exploring four key insights: the relationships between states and the environment; the relationships between states and other states; the relationship between human security and the environment and; the relationship between the state and human security. The Lancang Cascade provided useful data as to the relationship between states and the environment. The case of the NT2 also demonstrated that nations, specifically Laos, view the water resources within their own borders as economic commodities rather than ecological systems. SES challenged the dominant mindset in the MRB that divides shared resources along state boundaries and treats the environment as an external, dormant resource to be captured and transformed into energy. The Lancang Cascade also provided insights into the relationship between states and other states when the MRB is conceived of as a system rather than simply divided along state boundaries. An SES perspective provides a platform that allows states to re-envisage their relationships in regards to

⁷⁷¹ The most influential being: "MRC SEA Final"; Costanza et al., "Planning Approaches".

⁷⁷² "MRC SEA Final", 14. See also: Lamberts, "Little Impact, Much Damage."

the Mekong, suggesting that more cooperative approaches to the resources and ecological processes of the Mekong are crucial.

The NT2 case allowed a deeper understanding of the relationship between the environment and human security. Understanding the XBF and Nakai Plateau as ecological systems that underpin the human security of locals helps to understand the magnitude of the negative impacts wrought by the construction of the NT2. In fact, an SES perspective anticipates these impacts. Finally, the relationship between the state and human security was explored. Although the Lancang Cascade provided some general insights regarding the long distance impacts that can occur when one state captures the resources within its own borders, the most significant insights are provided by the Laotian context. SES challenges the current logic being used by the GoL that links hydropower construction with human development and poverty reduction. Instead of increasing human security, the current aggressive hydropower construction occurring within Laos is in fact creating serious insecurities and vulnerabilities. Instead of strengthening the state, they are undermining it by ignoring the importance of ecological services to the subsistence, livelihoods and economy of large numbers of Laotian citizens.

Conclusion

The government (of Laos) wants to build 60 dams over the next 20 or 30 years, and at the moment it doesn't have the capacity to deal with environmental and social impacts for any single one of them.

Dr. Thayer Scudder, Member of the NTPC 'International Panel of Experts'
New York Times, August 2014.⁷⁷³

This conclusion aims to achieve four things. Firstly, it will review the accomplishments of the thesis, looking at what it set out to achieve, how it set out to do this and how successful it has been in doing so. Secondly, it will look at the implications of the thesis for: policy and practice; security studies in general; and environmental security in particular. Thirdly, it will reflect on some of the challenges to Systemic Environmental Security. Finally, it will make suggestions for further research that can contribute to a greater understanding of the value of Systemic Environmental Security.

Achievements of the thesis

In order to understand whether the thesis has been successful in achieving what it set out to accomplish, we must briefly review the research questions and main hypothesis as established in the introduction and methodology. The three guiding research questions were:

1. Does environmental security have a central theoretical core that enables it to coherently analyse the linkages between security and the environment?
2. Is there a common theme that can be discerned within the literature on environmental security?

⁷⁷³ Jaques Leslie, "Large Dams Just Aren't Worth the Cost," *New York Times* August 22, 2014.

3. Does Systemic Environmental Security provide any unique insights into the relationship between security and the environment?

Accordingly, the hypothesis as outlined specifically in the introduction was that there *is* a discernible recurring theme to the environmental security discourse and that if operationalised to form a synthetic approach – known as Systemic Environmental Security – this more comprehensive analysis would provide unique security insights that would not otherwise be achieved.

Chapters One and Three addressed the first two questions. In regards to the first question, Chapter One, the literature review, outlined the disparate nature of Environmental Security Studies (ESS). Chapter Three analysed how this has led to a splintered idea of environmental security that defies definition. ESS has no theoretical or methodological core and it was observed that there have been three main reasons for the lack of a central premise to ESS. Firstly, ESS evolved during the opening up period of security studies following the end of the Cold War. Security studies itself became a highly fractious field of inquiry throughout this period, splintering into a range of different siloes focusing on different security referents and meanings of security. ESS is therefore a reflection of the broader splintered nature of security studies. Secondly, both ‘environment’ and ‘security’ are contentious terms. The critical work of Dalby emphasized the controversial nature of environment, indicating that it is often understood as separate from human activities and something to be conquered and controlled, rather than the context of human activities and that which fundamentally underpins human society. In regards to security, the splintered nature of security studies highlights the different ways that security can be understood – and, accordingly, the various ideas of who or what is to be secured. Finally, the cross disciplinary nature of ESS also contributes to the lack of a central premise to environmental security. A variety of epistemologies and methodologies compete in the same space to argue over the meaning and focus of ESS.

Chapter Three described this lack of a central theoretical core to ESS as “the problem with environmental security”. This “problem” was once again highlighted in Chapter Six by considering the case study chapters from the perspective of the four best developed paradigms of ESS: state security, human security, environmental

scarcities and violent conflict, and critical ecology. What was found was that each made a contribution to our understanding of the way that hydropower development in the Mekong is impacting on security, but none were able to capture the systemic nature of the relationships between the state, the environment, and human security. Unsurprisingly, there were significant differences between the positions of state security and human security. The importance of question one, therefore, is not only that it established that there is no central theoretical core to ESS and the reasons behind this, but that the lack of a united approach hinders ESS from providing a coherent and somewhat united analysis of the relationship between security and the environment.

The second question asked whether there is a central theme to ESS. Chapter Three outlined the ways in which a large proportion of the environmental security literature is seeking to understand the interactions between the state, the environment, and human security. Each epistemology approaches the problem from its own perspective, favouring a particular referent or unit of analysis. Each perspective is nevertheless attempting to come to terms with the complexity involved in understanding how these interact in a systemic way. While there is a recognition that there are links between the state, the environment and human security, analysing one in isolation from the others, limits the understanding of the whole. Based on this analysis of Chapter Three, the answer to the second question appears to be a qualified 'yes'. Yes, there is a recurring theme, but this must be qualified because although the similarities are discernible, given the disparate nature of ESS, the links are nevertheless tenuous.

In order to understand more clearly the relationship between the state, the environment and human security, the analytical framework of Systemic Environmental Security (SES) was outlined in Chapter Three. Instead of focusing on just one security referent, it was noted that an SES perspective instead investigates the relationship between the state, the environment and human security. Rather than seeking to understand how the state and the environment interact, or how human security and the environment interact, an SES perspective suggests that to understand the relationship between the environment and security we must not focus on *either* state security *or* human security but on *both*.

This brings us to the final and most important research question that sought to explore the unique perspective brought about by Systemic Environmental Security in regards to the relationship between the environment and security. Chapters Four and Five provided a rich source of data to analyse from an SES perspective, outlining the serious challenges that are arising in the Mekong River Basin (MRB) as a result of hydropower construction. Chapter Four examined the cascade of dams known as the Lancang Cascade that have been constructed in the Chinese section of the Mekong. Understanding the Lancang Cascade enabled a macro understanding of the MRB and the relationship between security and the environment. Chapter Five examined the Nam Theun 2 Dam in Laos and provided greater specificity for a micro understanding. Chapter Six then analysed the findings of Chapters Four and Five from the perspective of SES.

Specific contribution of the thesis

The analysis of Chapter Six demonstrates that SES facilitates insights into *four* key relationships relevant to security and the environment: 1) the relationships between states and the environment; 2) the relationships between states and other states; 3) the relationship between human security and the environment and; 4) the relationship between the state and human security. In regards to insight one, evidence from both the Lancang Cascade and the Nam Theun 2 established that states in the MRB tend to view their renewable resources in purely economic terms, and as both sovereign and exploitable. By viewing resources from this perspective, the dominant mindset drives a development imperative that seeks to transform the waters of the MRB into energy and profit. This hinders states from perceiving and understanding the range of other important renewable resources that are provided by the Mekong and its tributaries, such as fisheries, irrigation, riverside gardens and silt. These resources are not easily quantifiable in their value, not easily transformed into state and private capital, and their destruction is usually considered an 'externality' of hydropower construction.

The second important insight provided by SES is that viewing resources in this way can have a negative impact on the relationships between states. This knowledge primarily stems from the example of the Lancang Cascade, but is also related to the Lower Mekong mainstream dams that have been briefly discussed. As a result of the

construction of the Lancang Cascade and the supposed inequitable exploitation of the Mekong's resources, realism anticipates political tensions between states. Instead, the development imperative of the GMS, encouraged by a liberal institutionalist mindset, and reinforced by the 'ASEAN Way', facilitates a false understanding that encourages states to think of the MRB in a compartmentalised way, divided along state boundaries. On the contrary, SES indicates that states in the MRB are connected via a complex ecological system and not simply connected by borders.

What China does in its section of the river has a direct – albeit difficult to quantify – impact on the health of the environment in distant parts of the system, particularly in Cambodia and Vietnam. These impacts are most significant in the Delta and the Tonle Sap and threaten to wreak havoc with local ecosystems and the communities who rely on them. The problem is that all states have subscribed to the development imperative and view the environment in primarily economic terms. Without a significant paradigm shift there is therefore little room for a discourse of discontent. The unique insight of SES in regards to the relationship between states in the MRB is that whether they understand and accept it or not, riparians have a unique physical connection. From a normative perspective, each has a responsibility to the rest to ensure that the system functions as a whole and to seek ways of co-managing the system. It is not a matter of ensuring the security and prosperity of one nation or the other, but ensuring the security of the whole in the context of their ecological linkages. This cannot be fully grasped without an understanding of the third and fourth insights of SES as summarised below.

The third important insight illuminated by Systemic Environmental Security is in regards to the relationship between human security and the environment. In the MRB, this relationship is particularly strong given that many individuals and communities are heavily reliant on natural resources for their subsistence and livelihoods. The NT2 demonstrated clearly the strength of this relationship, showing that hundreds of thousands in central Laos are reliant on the resources of the rivers for their subsistence, livelihoods and economic prosperity. Fisheries, irrigation and agriculture, riverside gardens, and potable water are most important contributions to human security in the area. The link between human security and the environment is

perhaps the most expected and uncontroversial finding of the thesis given that it aligns with the environmental security literature that focuses on human security, such as that forwarded by Barnett, Dalby, Adger, Peluso and others.

Finally, SES engages with the relationship between the state and human security. This insight is related to the first, which found that states in the MRB view the environment primarily in economic terms. The example of the NT2 demonstrates very clearly that the relationship between the state and human security is not simply based on economic transactions that rely on increasing the revenue of the central government in order to redistribute this to individuals and communities. When environmental resources are valued by states only as a source of economic revenue, without due consideration for their wider importance in the context of ecological and social systems, this has significant negative impacts on human security. From the perspective of SES, therefore, the way that states view and interact with the environment is directly related to the relationship between human security and the environment.

This point is related to the second insight in that the negative security impacts of the Lancang Cascade and mainstream Mekong dams are and will primarily impact at the level of human security. Without this understanding, as well as an understanding of the complex ecological system of the MRB, states are unable to comprehend the security implications of their actions and how the activities within the borders of one state can severely impact on the security of another that they do not share a border with. Systemic Environmental Security provides a unique perspective and affords an opportunity for states who suffer from the negative impacts of hydropower – for example Vietnam and Cambodia – to create a security discourse that challenges the activities in another state – for example China – based on the principle of non-interference. The construction of the Lancang Cascade is interfering with the lives and livelihoods of millions downstream, and will continue to do so increasingly. One of the biggest challenges in this regard is that the effects of the Lancang Cascade – because they are temporally and spatially distant from the causes – are difficult to quantify in the here and now.

Summary and reflections on the research questions

It is clear that the thesis achieved what it set out to accomplish. It answered the first question as to why there is no theoretical core to ESS. It also answered the second question regarding the similarities across the ESS literature, developing the idea of Systemic Environmental Security. Finally it answered the third question by exploring the unique insights provided by a Systemic Environmental Security approach.

The question could be asked as to whether the research questions were themselves the right ones. Given the insights that have been outlined above, arguably these questions have shed valuable light on the concept of environmental security. The hypothesis that the framework of Systemic Environmental Security would shed valuable light on the relationship between security and the environment has proven itself to be correct. However, environmental security itself remains an amorphous idea. A question could have been asked about the definition of environmental security. Given the lack of definitional integrity and cohesion, it is possible that an investigation surrounding the definition of environmental security and the possible value that this may have contributed to the security literature in general would have also been a very valuable exercise. This may be an area of interest for future researchers.

Systemic Environmental Security: Implications for Theory and Practice

Although it is important that the thesis achieved what it set out to accomplish, it is also valuable to understand the implications of the development of the idea of Systemic Environmental Security. After all the research and analysis, it is essential to ask the important, yet confronting question of: “So what?” There is a range of potential implications, and it is not possible to go into them all in detail, however, this section will outline those that appear to be most relevant to both theory and practice. Firstly, in relation to practice, some implications of the thesis’ findings for the Mekong riparian states, and the region more generally, will be outlined. Secondly, some suggestions of what the development of SES means for security theory will be made.

Policy and Practice: “So what?” for the Mekong

Although it would be a positive for security in the MRB, it is difficult to see Mekong riparian states shifting their current national security mindset and traditional security paradigm as a result of the findings of SES. Nevertheless, an SES perspective demonstrates very clearly that a continuation of the current practice of rapid hydropower development in the MRB is unsustainable in terms of the regional economy, a disaster for the MRB’s complex ecological systems, and a growing tragedy for human security. The construction of the Lancang Cascade is a *fait accompli*, and there is no longer any amount of policy shifting or political wrangling that would change this. The same can be said of the NT2. Yet this thesis, and the large body of research that accompanies it, shows that the assumptions behind hydropower construction in regards to the damage it causes to social and ecological systems is consistently underplayed. This is of particular concern for the eleven planned Lower Mekong mainstream dams. In purely economic terms, the best-case scenario of these dams is a total financial gain of US\$33 billion. As we have observed, however, these financial gains come about as a result of losses to livelihoods and severe environmental destruction. The worst-case scenario could mean basin-wide financial losses of over a US\$250 billion, accompanying a collapse in the environmental resources of the MRB.⁷⁷⁴ Given that the research indicates that best-case scenarios are rarely – if ever – achieved, this should stand as a stark warning for states who continue to move forward with hydropower development.

An SES framework enables states to understand the relationship between themselves, the environment, and human security. It demonstrates very clearly that in the MRB, the relationship between states and human security is not one of purely economic paternalism, but is highly contingent on the impact the state has on the environment. In order to ensure the well-being of their citizens, it is absolutely essential – given the links between human security and the environment – that states do not remove, destroy, or degrade the environmental resources that are so crucial to lives and livelihoods. To do so rescinds the social contract between the

⁷⁷⁴ Costanza et al., "Planning Approaches", 25; Christopher G. Baker, "Dams, Power and Security in the Mekong: A Non-Traditional Security Assessment of Hydro-Development in the Mekong River Basin," in *NTS-Asia Research Paper* (Singapore: RSIS Centre for Non-Traditional Security (NTS) Studies for NTS-Asia, 2012), 19.

state and its citizens. In Laos, in particular, the social contract appears to be very much broken.

Although SES provides a perspective that can undoubtedly allow states to re-envision their relationship with human security, the most significant challenge is gaining policy attention and prioritisation for both social and environmental issues. One of the biggest challenges for SES is that if it is to be relevant at the policy level it must tread a fine line between forwarding important ecological principles and appearing to be “deep green”. The conflation of ecological issues with leftist politics is a consequence of the growth of Green parties who advocate strongly for the environment. Additionally, in the MRB, social and environmental issues tend to be the domain of NGOs and as a result are also treated with suspicion by states, business and institutions. The difficulty for SES is that it challenges the dominance of state-based thinking even while it is attempting to appeal to those who have a vested interest in the states dominance. This must be achieved without appearing to be politically oriented to the right, toeing the national security line, or supporting regimes that may be causing significant harm to their own populations.

There is no cogent reason, however, to place the environment on either side of politics. The concerns of SES and ESS in many ways transcend the political divide, but if environmental insecurity is to be decreased – whether it be through the reduction of violent conflict related to renewable resources, the development of humane and appropriate policies to shape migration flows, an increase in poverty alleviation measures, or indeed the refashioning of the role of states that have been dominant since at least the time of the Treaty of Westphalia – politics must play a role. Clearly, without the involvement and investment of states, little can be done about the interplay between states, the environment and human security.

Unfortunately this has not helped to answer the question of how to gain the attention of policymakers. Policymakers are expected to be clever “social engineers”, designing policy that positively influences outcomes, decreasing the levels of social, economic, and environmental stress, while improving the lives of its citizens and increasing the economic and political prowess of the states. But the complexity of environmental challenges – and their systemic nature – may in fact hinder, rather

than encourage the ingenuity necessary to prevent further environmental degradation. As Homer-Dixon argues:

Unfortunately...the syndrome of multiple, interacting, unpredictable, and rapidly changing environmental problems will increase the complexity and pressure of the policy-making setting. It will also generate increased 'social friction' as elites and interest groups struggle to protect their prerogatives. The ability of policy makers to be good social engineers is likely to go down, not up, as these stresses increase.⁷⁷⁵

National policymaking in the MRB occurs in the context of a complex web of political, economic, social, cultural and environmental challenges. It is understandable that balancing all these factors presents many difficulties. We must be careful not to excuse poor policymaking on over-complexity, however. The main implication of SES for policy and practice in relation to hydropower development in the MRB is that there has not been nearly *enough* attention paid to this complexity. Instead, the MRB and its resources have been viewed in far-too simplistic terms, as economic resources to be captured and profited from. SES shows clearly that it is time that policymakers pay much greater attention to the complex ecological system that they govern, and to those who rely on the continuing health and productivity of the system.

Thinking Systemically About Security: "So what?" for Security Studies

Chapters Two and Three demonstrated clearly the disparate nature of both ESS and security studies more generally. Security studies is broken into a range of different 'silos'; schools of thought that approach the idea of security from different epistemological and methodological positions. A systemic approach to security is at odds with this standard siloed approach of security studies. Even critical security studies, which has successfully opened up the referent of security to units other than the state, is still focused primarily on these units.⁷⁷⁶ The idea that security comes from securing the whole rather than the parts is still not part of the security paradigm. Much of the debate between the various schools of thought within security studies

⁷⁷⁵ Homer-Dixon, "On the Threshold," 102. See also: Richard A. Matthew, "Conclusion: Settling Contested Grounds," in *Contested Grounds*, ed. Daniel H. Deudney and Richard A. Matthew (New York: State University of New York Press, 1999), 300.

⁷⁷⁶ For example: Buzan, *People, States and Fear*.

are, in many ways, in a competition about ‘what or who is to be secured?’ The idea that in some cases, all referents can be simultaneously secured under a single rubric does not appear to have been considered. Systemic Environmental Security is therefore a challenge to security studies because it suggests that the competition between who or what is to be secured is extremely problematic – at least in the context of the environment. Narrowly focusing on only the security of states, without doubt limits a holistic understanding of security. The same can be said for focusing only on the security of individuals and communities. As Chapter Three highlighted, the majority of those engaged with the environmental security literature are already attempting to come to grips with the complex interaction between states, the environment and human security.

It is, however, vital that we do not overreach in regards to the importance of Systemic Environmental Security. There is no intention to usurp all knowledge and learning within security studies with a single systemic theory of everything. Clearly SES has links to, and has in some cases built on, a variety of different theoretical approaches. Without these important and insightful ideas, SES could not have been developed. SES, therefore, does not propose replacing states with humans as the referent object of security, nor does it suggest that states are the most important security referent. Both are obviously important but neither can be secure unless the underlying biophysical processes in which they reside are capable of providing life and supporting the fundamentals of human activity. Neither is it the ultimate end of individuals or states to secure the environment, but all must recognise that without a well-functioning biophysical environment, there can ultimately be no security.

This is a valuable idea for security studies. It is hoped that the analytical framework of SES makes the important contribution of giving security theorists reason to reconsider siloed and exclusive approaches to security. There are clearly situations where such an approach hinders our understanding of security rather than helps it. In particular, those attempting to engage with the complex issue of how security relates to the environment must understand the importance of the system and not simply focus on its component parts.

A framework for understanding complex environmental/social/political interactions: “So what?” for Environmental Security Studies

The ‘problem’ of the disparate nature of environmental security studies has not been ameliorated by the development of SES. SES does not change the fact that there are a variety of theoretical paradigms, epistemologies and ontologies that are engaged with the ambiguously named ‘environmental security’. It is not the intention of, nor would it be necessarily valuable for, SES to unite ESS into a homogenous and united whole. In fact, it must be acknowledged here that SES is essentially dependant on the richness of theory that results from the disparate nature of ESS, without which SES would have nothing to synthesise. The fact that the various theoretical approaches to ESS have different referents of security – from individuals to the state – forms the foundation for the analytical framework of SES.

The disparate nature of ESS is a problem in that it hinders the idea of environmental security from practical application at a policy level. The value of SES for environmental security studies is in its links to policy and the real world. It takes important elements of the environmental security discourse and synthesises them into an analytical framework which has demonstrated itself to be important and relevant in understanding the challenges in the Mekong. More investigation is needed, but it is hoped that SES can have more widespread applications in practice in other empirical settings. This would mean that environmental security can be used more effectively to understand large and complex challenges at the nexus of politics, society and the environment.

Reflections on Challenges

There have been significant challenges in researching and writing this thesis, in particular, developing the idea of Systemic Environmental Security. Chapter Three pointed out the challenges of any study into environmental security, and the methodology chapter laid out the particular challenges for this thesis. This section takes an opportunity to reflect on these challenges and what they mean for future research of this type.

The disparate, cross-disciplinary nature of ESS makes any research related to it both too expansive and overly specific at the same time. This thesis is a perfect example

of this awkward situation. Focusing on the Mekong River Basin has integrated five nation-states,⁷⁷⁷ a population of over 60 million, a basin with a catchment area of 795,000 km² and a river that is around 4,900 km long. Understanding such a large and complex eco-political-social system presents immense difficulties. Nevertheless, in order to understand the environmental security challenges associated with hydropower in the MRB, the system must be understood as a system without compartmentalising it into artificial units. If this thesis has achieved nothing else, it has at the very least clearly established that the propensity to divide complex ecological systems along national boundaries and according to the whims of a centralised state, constructing large infrastructure projects that fundamentally change the ecological system, is at the heart of the challenges to security in the MRB. It is difficult, if not impossible to approach these problems by examining only that which occurs within the boundary of a single state. It is impossible, for example, to understand the problems associated with the silt capture of the Lancang Dams by only studying the Chinese section of the river as it provides no understanding of the systemic way that silt impacts the Delta.

This relates to the challenge of the overly expansive nature of such investigations. In the case of the MRB, it is difficult to see how it could be otherwise. Nevertheless, this thesis has attempted to counter this difficulty by restricting the investigation to hydropower and focusing in on a single dam to examine the more immediately observable impacts through the case of the NT2. Arguably, focusing on the NT2 has been successful in providing a clearer understanding of the interaction between hydropower and security. We must, of course, use inference if we are to suggest that this relates to the Lancang Cascade and to hydropower more generally – although this in itself is not unusual in case study research.

The challenge is, therefore, not that there has been a focus on a single dam, but that the focus has only been on hydropower. This is because there are a range of other factors occurring in the Mekong that are contributing to the challenges facing states and communities. Climate change, growing populations and increasing urbanisation are just a few of the issues that are also interacting with the impacts of hydropower development. These are complex problems in and of themselves and adding them to

⁷⁷⁷ Keeping in mind that Myanmar has been excluded from the research.

the already complex nature of hydropower development in the MRB would only compound the difficulties with the scope of this study. Nevertheless it is difficult to avoid the fact that their absence presents difficulties to the idea of Systemic Environmental Security which seeks to understand the system in its entirety. This is not a challenge that can be easily overcome – if indeed it can be overcome at all. As Muir once wrote: “When we try to pick out anything by itself, we find it hitched to everything else in the Universe”⁷⁷⁸.

For SES in particular, and ESS in general, research that is to have any relevance will always face this challenge of being both overly expansive and narrow simultaneously. From a methodological perspective, this obviously lends itself to a pragmatic approach that is able to make judgements as to the best way to go about any given investigation. Dictating that a study should have any particular level of specificity is unhelpful. An investigation into the relationship between the state and a single village is valid if the environmental processes under investigation are site specific – for example a local aquifer or village managed forest. This is just as valid as an investigation into the relationship between state attitudes to CO² pollution, its effect on ocean acidification and how this may impact upon the food security options of small island nations.⁷⁷⁹ From the perspective of SES, both are equally valid, given that each is investigating the relationship between the state, the environment and human security, but each will obviously have a different level of specificity and will require a different knowledge base and methodological approach.

The second challenge is related to the first. Research is often valued for its specificity and depth. Research that burrows deeply into a specific topic, seeking to understand a single area of investigation in great detail is common in academic studies – both qualitative and quantitative. Such research is in fact the norm and is so because academic institutions are built around various knowledge siloes with their foundations in a particular ontology, splintered into a variety of epistemologies, and researching based on specific methodologies. Cross-disciplinary research – such as that required of any SES study – presents a challenge to this model, because it

⁷⁷⁸John Muir Misquoted," *Sierra Club*, 2014:

http://vault.sierraclub.org/john_muir_exhibit/writings/misquotes.aspx.

⁷⁷⁹ Carol Turley, "Environmental Consequences of Ocean Acidification: A Threat to Food Security," in *UNEP Emerging Issues* (Nairobi: UNEP, 2010).

either requires these different knowledge siloes to work together, attempting to find common methodological and epistemological ground – described in some detail in Chapter Three – or, as has occurred in this thesis, a single researcher must attempt to cross these divides within the confines of a single piece of research.

This being the case, the challenge is for the research to contain enough specificity for it to be considered of suitable academic value. Reflecting on this thesis specifically, it has required a depth of insight into a variety of academic research from the natural and social sciences. Without a knowledge of hydrology, fisheries, ecology and agriculture, the empirical section of this chapter would be weak and shallow. The knowledge required of the natural sciences for such an investigation is well beyond that which is normally required for a social science thesis investigating security. The opposite is also true for a natural science thesis where an in-depth knowledge of social science concepts would not normally be required. Yet this thesis demonstrates a deep connection with the international relations and security literature.

The question therefore is: Is the investigation specific enough? At its core this is a security thesis, yet the addition of that vexatious word ‘environmental’ adds much complication. The natural science literature in Chapters Four and Five is detailed and provides clear insights into the ecological challenges in the MRB. These have not been addressed in a superficial way nor from a simplistic policy perspective, yet there is no claim to scientific expertise here. It has to be acknowledged, however, that each of the issues – such as fisheries and hydrology – can be delved into in much greater depth. This undoubtedly provides ammunition for a strong critique of this and similar research. Yet if this large volume of information was to be included, the thesis would have become unmanageable.

The security side of the equation presents a different picture. There is both width and depth from a security perspective. Any scholar of environmental security does not have the luxury of being able to consider only one primary referent of security, nor to ignore epistemologies outside of a single perspective. This is obviously because ESS has no single referent or central epistemology. Coming to terms with environmental security means understanding a wide variety of security perspectives, yet width is no excuse for a lack of in-depth knowledge. This thesis has focused on

both traditional and human security studies, but it has also demonstrated a strong depth of knowledge in regards to the environmental scarcities and violent conflict literature, political ecology and critical security studies. Just as with the natural sciences, however, each of these subjects has its own large body of literature, yet to espouse them in great detail would once again have led to an unmanageable thesis.

The final challenge, therefore, arises when attempting to understand what or who constitutes an environmental security scholar. What skills, knowledge and perspectives are required from such an individual? Furthermore, are they welcome within the security or academic community? As to what skills are required, this thesis has outlined the need for a cross-disciplinary approach. Obviously an understanding of the natural and social sciences is required and, therefore, a strong interest in both, and the way that they interact is essential. In order to facilitate such interest and research, tertiary education must actively encourage a cross-disciplinary approach that nurtures those who seek to understand the links between the natural sciences and the social sciences, between the environment and security. But as has been observed already, academic institutions tend to focus on siloed research rather than cross-disciplinarity.

Dupont and Pearman discuss this problem in relation to climate change, viewing it as a conceptual and structural problem:

...our education system is not producing sufficient numbers of students and graduates with the requisite skills to effectively analyse the causes and consequences of climate change. The problem is both conceptual and structural. Conceptually, strategic and international security studies...is still overwhelmingly concerned with military conflict and this bias is reflected in our universities and teaching institutions. Structurally, the study of climate change is very stove-piped. Climate scientists see the issue primarily through the lens of physical science, economists focus on cost benefit calculations, environmentalists and business sceptics argue about desirable levels of greenhouse gas emissions and appropriate remedies, while strategists have largely ignored the subject altogether.⁷⁸⁰

⁷⁸⁰ Alan Dupont and Graeme Pearman, *Heating up the Planet: Climate Change and Security*, Lowy Institute Paper 12 (Double Bay: Lowy Institute for International Policy, Longueville Media, 2006).

This is obviously a much larger issue than can be – or needs to be – discussed in this thesis. Nevertheless, understanding this challenge gives greater context to the idea and development of Systemic Environmental Security.

Suggestions for further research

There is a range of potentially fruitful research areas that would provide rich and valuable data to explore, challenge, and strengthen the idea of Systemic Environmental Security. More research into hydropower development is the obvious place to start. As outlined in Chapter Six, there are many other hydropower projects on the Mekong and its tributaries that would make a valuable contribution. Lower Mekong mainstream dams most obviously need investigation given the large numbers of people who will be affected by their construction. A project that would provide clearer insight into the relationship between states, the environment, human security and other states would be the Yali Falls Dam given that it was built in Vietnam and sits just 80km upstream from Cambodia.⁷⁸¹ This would provide greater specificity and a micro view that would shed light on the potential impact of Laos' Don Sahong mainstream dam which is scheduled to be built just 1km from the Cambodian border.⁷⁸² Hydropower construction is occurring all throughout Asia, so shifting the focus from the MRB towards other river basins would be valuable. In particular, the Salween River, which flows first through China and then Myanmar, currently has thirteen dams planned on the Chinese section of the river, and another six proposed downstream in Myanmar.⁷⁸³

In South Asia, India, Nepal, Pakistan, Bangladesh, Sri Lanka and Bhutan are all engaging with various levels of hydropower construction. The obvious candidate is India, given that it too sits downstream from Chinese hydropower projects. Of particular interest, however, is Bhutan, which instead of focusing on Gross Domestic Product (GDP) focuses on Gross National Happiness (GNH).⁷⁸⁴ Of significant interest to the idea of SES is whether the Bhutanese government is aware of the

⁷⁸¹ <https://www.oxfam.org.au/explore/infrastructure-people-and-environment/save-the-mekong/3s-critical-environmental-zone/yali-falls-dam/>

⁷⁸² Ian G. Baird, "The Don Sahong Dam: Potential Impacts on Regional Fish Migrations, Livelihoods and Human Health," (Victoria, Canada: University of Victoria, August 2009).

⁷⁸³ <http://www.internationalrivers.org/resources/briefing-current-status-of-dam-projects-on-burma%E2%80%99s-salween-river-7868>

⁷⁸⁴ Victor Mallet, "Bhutan Hoping for Happiness with Hydropower," *Financial Times* January 2, 2014.

connections between itself and human security through the bridge of the environment and how this plays out in the context of hydropower. Of course China, the global leader in hydropower generation, would also provide valuable cases. Looking further afield, there is also significant hydropower construction occurring in both South America and Africa that warrants investigation.

If Systemic Environmental Security is to have more widespread appeal as a framework for understanding the relationship between the environment and security then it must also have relevance beyond hydropower. Aquifer systems and their links with economic productivity, human health and food security appear to be relevant to SES. Australia's Great Artesian Basin, China's North China Plain aquifer, and India's Upper Ganges and Indus River aquifer systems would potentially provide valuable insights into the relationship between security and the environment.⁷⁸⁵ Forestry activities also appear particularly germane given forestry's frequent links with both human security and state economic activities,⁷⁸⁶ and riverine and ocean fisheries may also prove relevant to SES. Global climate change would pose a significant challenge to the idea of SES given the immense scale of such an inquiry. Whether a case-study or case-studies could be established to support such an enquiry is an intriguing question.

It may also prove useful from a historical perspective to revisit the cases studied in other projects such as Homer-Dixon's *Project on Environment, Population and Security* (EPS), and the *Environmental Change and Acute Conflict* (ECAC) project. Bachler's *Environment and Conflicts Project* (ENCOP) and the *Global Environmental Change and Human Security* (GECHS) project. May also yield valuable new insights to the concept of SES.⁷⁸⁷ If SES provides new and unique insights into these cases then it helps to demonstrate its value to the environmental security literature more broadly.

Of interest and relevance would be cases where there appears to be a healthy relationship between the state, the environment and human security. Knowing what

⁷⁸⁵ Baker et al., "Food Security in Asia", 19.

⁷⁸⁶ David Pimentel et al., "The Value of Forests to World Food Security," *Human Ecology* 25, no. 1 (1997).

⁷⁸⁷ Homer-Dixon, "Environmental Scarcities."; Homer-Dixon and Blitt, eds., *Ecoviolence*; "Environmental Crisis: Regional Conflicts and Ways of Cooperation"; Matthew et al., eds., *Global Environmental Change and Human Security*.

factors have contributed to such healthy relationships would enable this knowledge to be transferred to other arenas where insecurity prevails in order to explore positive ways of increasing security in a systemic way. This would potentially be of interest to Peace Studies research. Possibly relevant to this is the role of democracy, given that in the MRB, all riparians are essentially one party governments.⁷⁸⁸ An understanding of the role of democracy is therefore important when considering the relationship between the state, the environment and human security and requires further investigation.⁷⁸⁹

Finally, the role of industry and business is missing in the majority of the environmental security literature: and SES is no exception in this respect. In the MRB, hydropower development is driven not only by states, but by international corporations and state-owned enterprises with a high profit motive. Although there has been acknowledgement within the thesis that corporations play a role in environmental harm, there has been no direct analysis of this – the focus being on states and human security. It is unusual to think of business as part of the security equation yet if corporations are taking actions that are driving insecurity, then obviously they need to be taken seriously in relation to security. Given Systemic Environmental Security's focus on systems and holistic understanding, then the role of business needs to be considered when such an analysis is warranted and incorporated into the theoretical framework if necessary.

Final reflections

The challenges in relation to hydropower in the MRB have been around at least since the early 1990s, during which time plans for the NT2 were well advanced and the construction of the Manwan Dam, the first dam of the Lancang Cascade, was completed. Since this time, scholars have been attempting to understand the complexity of these challenges and come to terms with the security implications of hydropower construction in the MRB. One of the most insightful examination of these

⁷⁸⁸ Although Cambodia is officially an exception, former Khmer Rouge cadre and now Prime Minister Hun Sen has ruled the country for over thirty years. See: "Hun Sen, Cambodia's Prime Minister, Marks 30 Years of Hardline Rule " *The Guardian* 14 January, 2015. <http://www.theguardian.com/world/2015/mar/22/bangkok-big-brother-politics-ruling-party-democracy>

⁷⁸⁹ Gleditsch, "Armed Conflict and the Environment."

issues was provided by Evelyn Goh in 2006, and her contribution is worth quoting at length:

The Mekong region's economic development is often pitted directly against ecological protection. Yet it should be clear that the connection between ecological and economic sustainability is human security; the question is not whether economic growth should be prioritised over conservation, but how the welfare and well-being of communities can be improved and ensured by distributing the benefits and costs of economic development in a way that does not undermine the ability of these communities to make a living and to enjoy an improving quality of life. Given that most of the information and data about such impacts are being collected on the ground by non-governmental organisations working within local communities, the acceptance that ensuring human security is one crucial responsibility of national governments is an important missing link that will connect these local movements to national, and eventually regional, agendas. This critical conceptual link will have to be forged if claims that national and regional development contributes to social, national and regional security are to be meaningful.⁷⁹⁰

This insightful passage highlights the security challenges that have arisen as a result of hydropower construction in the MRB, confirming the importance of the research agenda of this thesis. It furthermore demonstrates the persistent lack of a systemic understanding of the links between the state, the environment and human security in the region – given that the above passage was written nearly a decade ago. This thesis, and the development of the idea of Systemic Environmental Security, makes an immensely valuable contribution in regards to the missing conceptual link between states and human security in the MRB.

The analytical framework of Systemic Environmental Security conceptualises the links between the state, the environment and human security. It demonstrates very clearly that the economic activities of states that impact on the ecological systems within their own borders is having significant negative impacts on the human security of residents of the MRB. What is clear is that states neither understand nor respect the strong relationship that exists between themselves and human security. Systemic Environmental Security makes it clear that these links do exist, and – if states are to have any legitimacy – provides compelling reasons as to why these

⁷⁹⁰ Goh, "Developing the Mekong."

links must be taken very seriously. In order to avoid undermining their own legitimacy, states must fundamentally shift not only their relationship with the environment, but more importantly the relationship with their own citizens. However, as it currently stands in the MRB – most notably in Laos – states are the drivers of human insecurity rather than protectors and facilitators of it.

Any appeal to states that they must take a more considered and precautionary approach to hydropower – and other environmentally destructive practices – is essentially futile without firstly, recognising the critical importance of human security, and secondly, appreciating the importance of the environment to human security. Consideration of the importance of the lives and livelihoods of the millions who live in the region will in turn facilitate a recognition of the importance of the environment to human security.

Systemic Environmental Security provides this unique perspective, demonstrating that in the MRB, it is not just a matter of focusing on *either* state security *or* human security separately, but instead focusing on *both* in the context of the environment. Only from this perspective can a comprehensive understanding of the security situation in the Mekong River Basin be gained. It is hoped that the unique insights provided by Systemic Environmental Security can be applied in a range of contexts, providing clearer conceptualisations of the complex relationship between security and the environment.

Appendix 1

Expert Interviews

Interview Questions:

Environment and Climate

- What are the impacts of lower Mekong river dams on the ecosystem services of the Mekong river?
- What are the costs of replacing these services if they are lost?
- Have you witnessed or are you aware of regional changes due to global climate change.
- If so, how do these impact the river and the population that rely on it?
- In your opinion, are the biggest changes occurring on the Mekong due to climate change or anthropogenic impacts?
- Are there ways to mitigate against these changes?

Food and Water Security

- In your opinion, what role do Mekong fisheries and agriculture play in local food security?
- What role do Mekong fisheries and agriculture play in regional food security?
- What are the current assessments of the potential losses to fisheries and agriculture due to main stream dams?
- Are you aware of any studies that estimate losses to fisheries or rice production from mains stream dams?
- Are you aware of any studies that estimate losses to fisheries or rice production from climate change?
- Is there significant aquifer depletion in the region?
- What is being done about salinity in the delta?
- What is the role of GMO crops in the region?
- Are there potential benefits to irrigation from mainstream dams?
- What would be the likely impacts of proposed lower mainstream dams on regional and local food security?
- Are there changes in population and appetites which may impact on food security?

Migration and Human Security

- What has been the consequences to populations living in the Mekong River Basin from previously built dams on the Mekong's tributaries or Upper Basin Dams?
- In these circumstances, has there been initial forced relocation?
- What have been the longer term impacts to populations in these areas in regards to health, nutrition and livelihoods?
- As a result of climate change or anthropogenic impacts, has there been any migration occurring in the region?
- In your opinion, if large scale migration were to occur, where would these migrants go and why?
- Do you see any evidence of regional ethnic tensions?

International Security and Conflict

- In your opinion, what have been the causes of past regional conflicts? (leave the time scale open to the interviewee but perhaps press on recent or pre-20th century if they do not elaborate)
- Do you believe there are currently any tensions that may result in wider spread regional conflict?
- Is ASEAN an adequate forum to resolve regional issues?
- Do you believe that the issues involving dams are significant enough to create armed conflict? Please elaborate.
- Can you foresee a situation where Lower Mekong states form a bloc to put pressure on China for more information or dam building cessation?
- What would be the consequences of a single lower basin mainstream dam? Get expert to elaborate around the themes of conflict, food security, *tragedy of the commons*.
- What role do local and regional governance structures have that could mitigate or influence the likelihood or result of conflict should it occur?

Governance issues

- What role does the Mekong River Commission play in governance of the Mekong.
- Is this role adequate? Should they have more/less power? Please elaborate.
- What is your opinion of the interactions between nations

Economy and Development

- Have you done, or are you aware of analyses that estimate the cost of replacing renewable resources in the Delta/Tonle Sap/Upper Mekong (or other basin section specific to expert)?
- Is there a trade-off between development and environment in the Mekong River Basin.
- What are the economic ramifications of not developing?
- What are the economic ramifications of developing in this way?

Appendix 2

Villager interviews

Interview Questions

- How has the NT2 dam affected your village? In general would you say that it has had a positive, neutral or negative impact?
- Has there been any impact (positive or negative) on food production and availability as a result of the construction and running of the NT2 dam and/or reservoir?
- Has there been any impact (positive or negative) on the availability of fish and your ability to catch it as a result of the construction and running of the NT2 dam and/or reservoir?
- Has there been any impact (positive or negative) on your ability to grow, harvest and store rice and/or other agricultural products as a result of the construction and running of the NT2 dam and/or reservoir?
- Has there been any impact (positive or negative) on your livestock as a result of the construction and running of the NT2 dam and/or reservoir?
- Has there been any impact (positive or negative) on water quality and/or availability as a result of the construction and running of the NT2 dam and/or reservoir?
- Has there been any impact (positive or negative) on your health, or the health of those in the village (that you are aware of) as a result of the construction and operation of the NT2 dam and/or reservoir?
- Have you received any compensation from the NTPC or the GoL for the changes that have occurred as a result of the NT2 dam and/or reservoir?
- If you did receive compensation, do you think it was adequate? Why or why not?
- Has there been any impact on the cost of living (such as the price of electricity, the price of fuel, or the price of food) since the construction and operation of the NT2 dam and/or reservoir?
- Has there been any impact on the local environment or ecosystem services as a result of the construction and operation of the NT2 dam and/or reservoir?
- Has there been any emigration from the village as a result of the construction and operation of the NT2 dam and/or reservoir? If so, why do you believe it is linked to the construction and operation of the NT2 dam and/or reservoir?

- Overall, would you say that the construction and operation of the NT2 dam and/or reservoir has been positive, neutral or negative to: yourself; your village; the nation; the government; the NTPC?
- Is there anything else you would like to add or discuss?

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