

THE POWER PROBLEMATIC IN SOCIAL-ECOLOGICAL SYSTEMS

A Dissertation

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by

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BIOGRAPHICAL SKETCH

Micah is an analytic practitioner, combining a professional portfolio in project management and technical advisory with a parallel program in applied research along the society-nature nexus. Key focal areas include complex systems' analysis, natural resource governance, environmental conservation, climate change and conflict processes. Having previously lived and worked in the United States, the United Kingdom, Bangladesh, Afghanistan, Cambodia, and the Mekong Region more generally, Micah's professional engagement now focuses primarily on the Lao People's Democratic Republic. He is the son of an eleventh-generation American farmer and the father of four.

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ABSTRACT

The Power Problematic in Social-Ecological Systems

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Cornell University, 2016

The resilience framework provides a dynamic approach to the analysis and management of complex social-ecological systems, emphasizing nonlinearity, feedbacks, and multiscale processes along the social-ecological nexus. In recent years, however, a number of scholars and practitioners have noted various insufficiencies in the formulation of the resilience framework, including its lack of engagement with the dimensions of power within social-ecological systems, which blunt the analytical potential of resilience and run the risk of undermining resilience-based management objectives. This work engages with this power problematic within social-ecological systems by exploring ways in which power is (re)produced and operationalized within social-ecological systems across three geographic locations in two countries, Lao PDR and Afghanistan. In particular, this work focuses attention on how power functions to shape knowledge and discourses within projects of environmental governance, how these discourses are employed to legitimize the claims of the powerful, and the social and ecological outcomes that occur as these power constructs map out across the spaces of social-ecological systems. Center-periphery relations, projects of state building, and narratives of environmental and state security are explored in some detail with regard to how

they intersect with environmental governance and the implications of this for the management of social-ecological systems.

CHAPTER 1: INTRODUCTION- SOCIAL-ECOLOGICAL SYSTEMS AND THE POWER PROBLEMATIC

BACKGROUND

Global environmental change, the persistence of endemic poverty and heightened tensions surrounding resource scarcity draw attention to the potential failure of contemporary governance regimes to manage the complexities of the biospheric system. This in turn raises questions about the sufficiency of our dominant political and programmatic prescriptions to address these urgent threats (Escobar 1999). The failure of contemporary governance regimes to successfully manage for change has been attributed by some scholars and practitioners to an over emphasis on equilibrium and steady-state models, which underlie global natural resource governance regimes (Arrow et al. 1995, Berkes et al. 2000, Folke et al. 2002). As such, the case can be made for new governance paradigms founded on far-from-equilibrium approaches to complex systems' management. The resilience framework for the management of coupled social-ecological systems provides one such alternative paradigm, emphasizing non-linearity, the importance of multi-scalar feedback mechanisms, and a more dialectical understanding of social and ecological processes. Both as an analytical framework and as a mobilizing metaphor, resilience has been taken up within policies and programs across a number of sectors and geographic contexts (Bahadur et al. 2013) to constitute what might arguably be considered the leading counter-narrative for resource governance regimes across the world (Nelson et al. 2007, Walsh-Dilley et al. 2013).

Despite its prominence amongst some scholars and practitioners, the resilience framework has met with a number of critiques that suggest that current formulations of the framework are

insufficient to engage with the complexities of social system dynamics (Davidson 2013) and are ineffective at addressing core social science concepts (Duit et al. 2010). Critiques of the application of the resilience framework within socio-political contexts emphasize limitations based on its descriptive, analytic, and normative dimensions (Barrett and Constanas 2014). Key (and closely related) critiques relate to its tendency to assume or imply causal determinacy, its de-privileging of the role of individual and social agency (Adger et al. 2001, Davidson 2010), its insufficient engagement with the role of power in shaping social-ecological outcomes (Adger 2001, Davidson 2013, Cretney 2014), that the conceptual framing of resilience is not pro-poor (Béné et al. 2012) and broader questions relating to the assumed consonance between social and ecological structures and functions (Welsh 2014). My research engages somewhat with the breadth of these critiques, but focuses attention more precisely on one core problem: that the fundamental assumptions of the resilience framework are naïve about the workings of power (Walsh-Dilley et al. 2013).

There are several reasons for this. De-privileging power relations in social-ecological systems not only blunts the analytical potential of the resilience framework with regard to social and ecological system functions but also, in its practical application within real-world contexts, runs the risk of producing outcomes at variance with its intentions (Zimmerer 2006). Questions of power also problematize the notion of resilience as an inherently desirable, normative goal for society (Engle 2011) recognizing that, for example, inequitable and oppressive governance regimes may certainly be resilient without being, by broad social consensus, ‘desirable’ (Carr 2008, Olsson et al. 2014). Even the largely positive concepts of adaptation and transformation—highly suggestive of change away from undesirable systems—are by no means immune to co-option by powerful actors who also use such mechanisms to entrench and protect their interests

or social legitimacy when these become untenable under existing social or ecological conditions (Davidson 2010, Brown 2014, Béné et al. 2014).

Before going further, it may be useful here to make explicit what I mean by ‘power’ and how I am conceptualizing it within social-ecological systems. Following Paulson and others (2003:205), I conceptualize power as “a social relation built on an asymmetrical distribution of resources and risks... [located in] the interactions among, and the processes that constitute, people, places and resources.” This definition, however, remains a little vague. While power understood as dominance, located primarily in the apparatuses of the state or agencies bearing its delegated authority, and in which force, violence, and coercion are strongly implied, is perhaps most obvious, its application to understanding social processes within social-ecological systems is limited by its a priori concern with the formal apparatus of society. Including these formal apparatuses—but also elaborating on and departing from them—I am invoking a particular, Foucaultian view that emphasizes the multiplicity of power within and across society, as something overlapping, fluid and negotiated (Foucault 1984). Foucault’s (2007) concept of governmentality provides an important theoretical construct for engaging with the functions of power within society, useful for these efforts. Within governmentality, power is understood not primarily as dyadic (person-to-person), quantitative or an object of possession. Rather, it is understood to be diffuse, functioning throughout society to shape actions (Foucault, 1982) and thus while it may crystallize in the apparatus of the state (Agnew 1999), or powerful commercial or military institutions, it is always shared, relational, and differentiated, and thus never hegemonic (Huxley 2007). “The exercise of power” writes Foucault (1982: 792), “is not a naked fact, nor is it a structure which holds out or is smashed: It is elaborated, transformed, organized; it endows itself with processes which are more or less adjusted to the situation.” This view of

power, I suggest, is useful to allow us to move beyond an analysis of state institutions, legal forms and explicit codes to interrogate the subtext of these and so better to understand the full scope of their influence. It also allows us to focus attention now only on how power may be destructive and exclusionary, but also how it is generative, creative and productive.

While the following papers and the conclusion of this collection will provide more detail, it may be worthwhile to anticipate a little with regard to two analytic emphases that figure prominently across each of the papers: how discourses of power infuse the governance of social-ecological systems and the spatialization of discursive and other forms of power within real-world systems.

POWER AND DISCOURSE

Discourses are words, but they are not merely words. They are political constructs of power that legitimize certain policy orthodoxies and materialize in laws and programmatic prescriptions with practical and material outcomes (Arts and Buizer 2009) along the society-nature nexus. In so doing, they play a key role in formulating and justifying policies and interventions that condition the resilience of social-ecological systems. In each of the following chapters discourse analysis plays an important role (alongside other analytic approaches) in how I go about seeking to understand power dynamics within these systems. Even in cases where militarization, armed conflict and more overt forms of power are operative in my case study areas, the subtext of discourse surrounding such things as (environmental, state and other forms of) security and (legal) exceptional modes of governance all play an important role in legitimizing armed violence and others forms of coercion. In my research, the analysis of these power discourses is also given ample play because, in some sense, this is where the surprises lie, as I seek to unearth the (power-based) taken-for-granted assumptions that tend to be entirely outside the purview of

environmental managers and resilience scholars. Further, these ‘surprises’ come to overturn the unproblematic narratives regarding the causes and outcomes of environmental degradation, social development and other key elements that are core to resilience assessment.

THE SPATIALIZATIONS OF POWER

The other--strongly related-- analytic emphasis that looms large in my research is the role of power in space or, said differently, the ways in which forms of power are spatialized within social-ecological systems, and the implications of these spatializations. This emphasis is, in my view, almost unavoidable. Understanding complexity in real-world systems and applying this understanding to addressing real-world problems requires that analysis be grounded in particular systems—systems that are necessarily bounded in space and time. In so doing, we are reminded that social-ecological systems are geographic objects. This observation is not especially novel. It does, however, open up very interesting possibilities for exploring how key elements and processes of social-ecological systems are rooted in, and map out onto, space and time and the implications of these space-time dynamics for system processes. This preoccupation with space and power in social-ecological systems manifests in various ways throughout the papers, and varies by research context. In general, however, this leads the analyses toward such spatial objects as boundaries (their meanings, implications for environmental governance and the power-laden social processes through which they are formed and maintained), zonation and spatial planning (and the normative implications of these spatial units, and the social processes that condition them), and a more general interest in how power is transmitted across geographies, how territory is politicized and the implications of these geographic imaginings for social-ecological outcomes.

CHAPTERS

As I have noted, this research project has crystallized in four distinct but complementary research papers, each of which explores different manifestations of power in the context of social-ecological systems. In this section, I will introduce each of these in order after a brief description of the methods chapter which precedes these.

Chapter 2: Research settings and methods

Provides the background on site selection for the research, methods used for data collection and analysis and descriptions of individuals and groups involved. This chapter also includes information on the strategy used for strengthening the validity of the research findings.

Chapter 3. The Power problematic: Exploring the uncertain terrains of political ecology and the resilience framework¹

In this paper, I lay the theoretical foundation for incorporating a more power-conscious engagement within various aspects of social-ecological systems' scholarship. In order to build these theoretical constructs, I explore the various shared territories and assumptions that underlie both political ecology and resilience thinking, identifying elements that allow for cross-walking between the two. I then explore some key areas of divergence, focusing attention on how the treatment of power within political ecology may produce important insights for the analysis of social-ecological systems, and with what implications for resilience. To anticipate a little, these insights focus primarily on two large domains: (1) how power functions in the (re)production of

¹ Published as Ingalls, M., & Stedman, R. (2016). The power problematic: exploring the uncertain terrains of political ecology and the resilience framework. *Ecology and Society*, 21(1).

knowledge in and about social-ecological systems and how knowledge claims aggregate up into environmental discourses that legitimize some modes of governance, while delegitimizing others in ways that reflect existing power asymmetries. (2) how power functions in scale-making and other scalar processes, privileging some selections whilst discounting others, in ways that shapes systems' analysis and, by extension, the sorts of interventions that are promoted for the management of these systems.

Chapter 4. Missing the forest for the trees? Navigating the trade-offs between climate mitigation and adaptation under REDD+²

This paper focuses critical attention on the win-win discourses that have come to dominate global climate change policies and programmatic approaches. In particular, this paper uses social-ecological resilience as an analytic lens to interrogate the synergies and trade-offs between climate change mitigation and adaptation manifest in how REDD+ project are operationalized. Specifically, the paper looks at how REDD-as-practiced (1) functions to differentially select and engage with drivers of forest change, (2) how proposed REDD interventions might intersect with existing disturbance regimes, and with what implications for diversity and structural heterogeneity and (3) how potential benefit streams from market-based carbon trading might influence existing efforts at decentralization. For each of these areas, analysis focuses on how these dynamics play a role in social-ecological resilience and the ways in which forms of power operate within the trade-offs that are made, and who might be expected to win and lose from these decisions.

² Published as Ingalls, M.L. and Dwyer, M.B. (2016). Missing the forest for the trees? Navigating the trade-offs between mitigation and adaptation under REDD. *Climatic Change*, pp.1-14.

Chapter 5. Not just another variable: Untangling the spatialities of power within social-ecological systems

Recognizing the social-ecological systems are spatial (geographic) objects, this paper engages specifically with the spatial dimensions of power—how it interacts with spatial processes (e.g., zonation, boundary demarcations, international borders) and, more generally, how discourses and policies—all reflective of structural power—are spatialized within social-ecological systems. Drawing on a case study from Xe Pian National Protected Area along the Lao-Cambodian border, the paper looks at how particular environmental discourses were employed in the creation of the NPA, the implicit assumptions underlying these discourses and their impacts on social-ecological systems. The paper also addresses the role of the military and security-exceptional modes of governance that have intersected problematically with environmental security and the governance of local systems.

Chapter 6. Resilience on the margins: Insurgency, agency and conflict in Afghanistan's Spin Ghar

This paper does something quite different than the previous two empirical papers, looking at the role of armed conflict within social-ecological systems during a time of war. It draws on research along the lower slopes of the Spin Ghar (White Mountains) of Afghanistan in the area surrounding Tora Bora, a place that has held important symbolic and strategic significance during the Soviet Conflict in the 1970s and, more recently, as the last stand of Osama bin Laden inside Afghanistan in 2001. In it, I analyze some ways in which military conflict, as a particular expression of power (or, perhaps more accurately, a particular set of overlapping power dynamics), directly impacts on resource governance and a variety of environmental indicators (including rangeland quality, deforestation, siltation, erosion and agricultural land use changes).

Beyond this, however, the paper looks at the subtext of these phenomena of power-relations manifest in the social-ecological system. Specifically, analysis focuses on particular narratives of state-making and border (in)security and how these have shaped military strategies in these areas, and the impacts of these on social-ecological resilience. Resilience, hegemony and local agency will also be a key area of analysis.

Chapter 7: Conclusion

I close the dissertation with a thematic cross-walking of the theoretical chapter (ch.3) and the three subsequent empirical chapters. This chapter focuses on how key theoretical concepts and themes were used throughout the papers, how they relate to one another, and some indications of future research directions building on each of these. Focal themes in this chapter include ecological modernization, neoliberal environmentalism, challenging the language of win-win, the security exception in environmental governance, peripheral spaces and the centralizing state, hegemony and agency and a concluding section advancing a political ecology of resilience.

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CHAPTER 2: RESEARCH SETTINGS AND METHODS

These explorations of power, space, discourse (and others) are addressed through four chapters, each dealing with different dimensions, or materializations, of power. This chapter deals with the methods used to develop the empirical chapters (ch. 3-5) and the geographic contexts within which this research was carried out.

RESEARCH QUESTIONS

In order to explore the spatial and temporal attributes and processes of selected complex social-ecological systems in general and, more specifically, how power shapes the spatial-temporal dimensions of resilience to climate change within these systems, I explore the following question and its associated sub-questions:

How does the construction and exercise of power within the spaces of complex social-ecological systems in the study areas in Laos and Afghanistan interact with and shape the resilience of those systems to climate change drivers? In order to ‘get at’ this question I engage with the following sub-questions:

Table 1: Research questions on power and resilience

Sub-Question	Link to Climate Resilience
1 How does power (of various types) map onto space, with what on-the-ground impacts for social-ecological systems?	Power is expressed through spatial relations and interacts across space. National and international policies and programs of governance (including REDD, NPA systems, forestry regulations, land policies and practice, etc.) have spatial relations, differentially producing on-the-ground impacts and set the parameters within which different social and ecological processes operate and are negotiated by different actors. Environmental narratives and other discourses construct legitimacy of certain kinds of society-nature interactions

	in particular places, including ‘appropriate’ livelihood strategies and climate adaptation options, questions of ownership and access, etc.
2 How do these various forms of power shape the spatial and temporal arrangement of system components and processes, important for the resilience of the system(s) of interest to climate change?	Social and ecological units are situated in time and space, and interact across space, all in ways which are shaped by power relations. Distances, process flows and resource streams are all shaped by these power dynamics, all with implications for resilience and adaptation to climate change. Centre versus periphery are determined with reference to the spatiality of power
3 How does power function to shape the nature, type, placement and meanings of (administrative, tenurial and protected-area, etc.) boundaries with the system(s)?	Climate change impacts, and the resource for adapting to these, are distributed across space. Boundaries and boundary-making processes are negotiated by power, shape resource access, locus of decision-making and policy-induced constraints on flexibility and mobility, mapping onto the climate-induced shifts in resource abundance. Boundaries may have different meanings for different sets of actors and may change over time
4 What role does power play in structuring mobility and flexibility (at larger spatial scales such as economic migration, or movement in space at micro and meso-scales), with what potential outcomes for system resilience to climate change impacts?	The resilience of social and ecological systems relates to the ability to move across spaces (avoiding scarcity or disturbances, accessing resources which may shift spatially over time), labor migrations, spatial subsidies (including resource flows, species migrations, etc.). Knowledge systems along the social-ecological nexus may exhibit spatial dynamics (context specificity of knowledge)

FOCAL GEOGRAPHIES

The research focused primarily on three focal geographies in two countries (two National Protected Areas in Laos, and the Afghan-Pakistani border area of eastern Afghanistan, figure 1).

Site Selection

Site selection was based upon the following criteria in order to allow me access to the specific social-ecological systems wherein initial analysis (refined through time) suggested particularly interesting sites, or areas that were able to provide the material needed to get at the research questions. Selection criteria included:

1. Site(s) that have been affected by changing climate conditions or weather related events in recent years as identified, for example, in the National Adaptation Program of Action (NAPA).
2. Site(s) that allow for a range of agroecological and social conditions (e.g. lowland, ethnic Lao paddy-rice and aquatic-resource based system and an upland, indigenous community forest-resource-dependent system).
3. Areas with known or suspected military involvement
4. Site(s) that allow for the interrogation of social processes of boundary demarcation (such as NPA boundaries), or areas where new land uses are being actively negotiated.
5. Site(s) that are politically accessible

All research contexts provide limited access. In Afghanistan, active armed conflict along the Afghan-Pakistani border provides a significant structural barrier to potential research access and

a security risk. Access to the site was secured through my position as a technical expert to the United States Agency for International Development (USAID)-implementing agency Development Alternatives Inc. (DAI), that provided physical access to the area, opportunity for participatory research with local community representatives (see below), research assistants and physical security (in the form of armed guards). In Laos, a notoriously-secretive Communist country lacking a variety of civil liberties that does not offer student visas, local access was secured through my professional appointments under the World Wide Fund for Nature and the International Union for the Conservation of Nature (IUCN).

Xe Pian National Protected Area, Lao PDR

Xe Pian NPA is one of Laos' largest NPAs, covering 240,000 hectares of generally contiguous dry dipterocarp and semi-evergreen forests, and is located in southern-most part of the country adjacent to the Cambodian border, falling within Pathoumphone and Khong Districts in Champasak Province and Sanamxay District in Attapeu Province. The NPA ranks high amongst priority protected areas within Laos and the region for its conservation significance (Poulsen and Luanglath 2005), with historically endemic populations of a number of mammalian, avian and other species of conservation importance. The NPA is largely forested, maintaining a substantial carbon sink.

In addition to its value for providing climate regulation and biodiversity, Xe Pian NPA is an IUCN Category VI 'Protected Area with Sustainable Use of Natural Resources' (IUCN, 2011), providing livelihood resources for a resident population of more than 10,000 indigenous and local people throughout 65 villages located within or adjacent to the NPA, including Brao (Lave) and Jrou Dak (Sou) people. For these communities, the NPA provides numerous NTFPs, fish and

aquatic resources for consumption, medicine, housing, handicrafts for use and sale. The land resources of Xe Pian NPA also provide important areas for rice production in paddies and, to a smaller degree, in swiddens. Nature-based tourism has also become an important source of income for some local communities provided by the NPA.

In recent years, Xe Pian NPA has been a focal area for an illegal international market in the CITES Protected rosewood *Dalbergia cochinchinensis* (EIA 2014), possibly the impetus of an unprecedented move by the military to secure a road concession through the southern part of the NPA in 2012,³ an area known to contain some of the largest remaining stocks of rosewood.

In 2012, WWF and the forest carbon consultancy company ObF initiated a Feasibility Study and, subsequent to this, the design of a REDD Project which was registered under the Voluntary Carbon Standards (VCS) and moved to external validation in 2014.

Xe Sap National Protected Area (NPA), Lao PDR

Xe Sap NPA covers 1,498 km² in Salavanh and Xekong Provinces in southern Laos. Altitude ranges from 400 to 2066 m *asl*, with a landscape comprising of dry dipterocarp, moist evergreen and montane grasslands. The discovery of the extremely rare ungulate the Saola (*Pseudoryx nghetinhensis*) in 1992, with one subsequent confirmed sighting in 2013, has cast the NPA into the international spotlight and attracted more than 1 million dollars in conservation funding between 2008 and 2015, as well as a REDD Feasibility Study to explore the possibility of long-term carbon financing for forest conservation.

³ According to local officials, the concession request was prompted by the late General Duangchai Phichit (interview, Champasak Province, 2013), after whose death in 2014 the Government of Laos rescinded the concession and ordered the withdrawal of military, though military remains actively involved in the area according to local residents (Interview, Xe Pian NPA, 2014).

As in the case of Xe Pian NPA, Xe Sap is a Category VI Protected Area, supporting approximately 15,000 people within 54 villages on the boundary of, or adjacent to, the NPA, many of which were moved out of the NPA ‘several years ago’ to limit the impacts of swidden cultivation on forest resources (WWF and ObF, 2013).

Both of these NPAs, together with their surrounding areas are located along international borders, exhibit a diversity of management relations with military units, are impacted by illegal transboundary logging activities, host REDD-related programming and are managed through diverse government and non-government institutions and agencies, and are of national or international biodiversity significance . These areas host large resident populations of resource-dependent people, are in various stages of boundary demarcation and Land-Use Planning and are impacted by foreign-investment driver land concessions. These factors create a complex arrangement of local, national and international power relations and thus ideal conditions for the exploration of spatial power dynamics within areas known to be particularly vulnerable to global climate change.

Chaprahar Watershed, Afghanistan

Chaprahar Watershed, located in Nangarhar Province, eastern Afghanistan has been a focal site of armed conflict in the early 1980s up until the present time. The catchment lays along the northern piedmont of the Spin Ghar (or Safed Koh, in Urdu) Mountains. I will focus attention on its upper reaches in Pachir Wa Agam District terminating in Tora Bora, along the Pakistani border. This area has served as strategic and symbolic role throughout the past three decades of conflict as an area of insurgency and armed resistance as well as a burgeoning opium and timber trade.

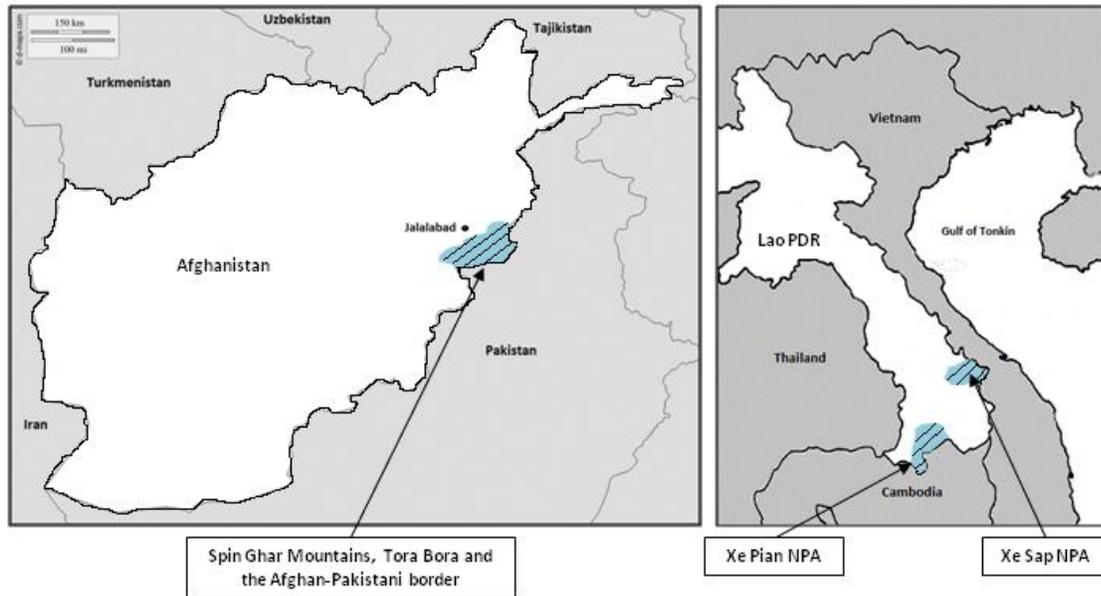


Figure 1: Research sites in context: Afghanistan and Laos

RESEARCH APPROACH AND UNDERLYING PARADIGMS

In order to address the research questions I took an inductive approach, building upon primary data gathered through community consultations, key person interviews, community-led spatial and temporal mapping activities, and document and discourse analysis in order to construct theory that is grounded in the data (Charmaz, 2006; Creswell, 2009). This research is carried out at national and sub-national levels in order to explore how, and with what impacts, these spatial-temporal processes function, focusing not only on policy discourses and the rhetoric of programs of governance, but also what they actually do on the ground. Interrogating these dynamics at different scales also helps elucidate cross-scale linkages and dynamics. While the specific methods employed in order to ‘get at’ the data needed to answer the research questions are modified throughout the research process, a number of proposed strategies and techniques are presented below. First, however, a word is needed in regard to the selection of research paradigm

and some justification for the appropriateness of the proposed approach for engaging with the research questions.

In order to situate the research within existing research traditions and operating standards I have selectively borrowed from three sets of scholarly traditions:

1. **Political Ecology** (due to its analytical focus on the (ab)use of power and the relationship between ecological systems and political economy and, secondarily, its methodological tendency toward qualitative social research approaches; Paulson *et al.* 2005),
2. **Grounded Theory** (selected for its focus on inductive research leading to the (re)formulation of theory and tendency to focus on bottom-up processes of social research; Charmaz, 2006) and
3. **Research approaches common to social-ecological resilience scholarship**, which intentionally invoke coupled-systems concepts and site-based research into the research design (e.g. Resilience Alliance, 2007), including participatory identification of key system variables and processes, trajectories of change, possible alternative futures, identification of key attributes of the system which are important to participants, etc.

I have selected portions of each of these research approaches because they are well-suited to the questions at hand (giving me the tools with which to gather and analyze the data required, and a set of existing literature traditions from which to draw and into which to allow my research to ‘speak’) and also because they provide a comfortable ‘fit’ for the exercise of my own scholarly paradigms: *social-constructionism* (regarding social and cultural artifacts- institutions, legal

structures, norms, knowledge, etc. to be socially constructed) and *critical theory* (which regards those social constructs to be highly susceptible to various uses of power). These paradigms and associated research traditions shape the approaches taken to the data collection and analysis, with a view toward building theory from the data and insights which are emergent from the research.

This research approach is most suited to the research at hand for a number of reasons: First, the key variables of interest in understanding the spatiality of resilience remain insufficiently defined within empirical studies and the processes by which these variables interact is inadequately understood (Cumming, 2011) requiring exploratory, qualitative research approaches, possibly as a step toward informing potential (subsequent) quantitative research. Second, we are at a stage of hypothesis formation and theory development, a task well-suited to the qualitative research approaches utilized within the political ecology and grounded theory paradigms and set forth within this proposal (Glaser and Strauss, 1967; Strauss, 1987). Third, and related to the first, Laos itself is an understudied context, lacking a substantial corpus of literature from which to confidently propose appropriate variables of concern, particularly for complex social-ecological systems which are the focus of this research. Finally, localized research of this nature is particularly needed in regard to resilience and climate change adaptation in Laos (GFDRR, 2011), due to the tendency of Global Climate Models and Regional Climate Models to build off from highly-aggregated datasets, proposing only very coarsely-resolved future scenarios with limited applicability to specific social-ecological settings (Crissman *et al.* 2001). Site-specific research is needed not only to explore local-level biophysical and climatic changes but also the interaction between these changes and the structuring of local and perilocal social responses. Methodological procedure and precedent for specific approaches employed are drawn both from within and outside of these traditions. Such

specific techniques (detailed below) include participatory (georeferenced) mapping of the spatial dynamics of resource use and tenure, boundary demarcation events and contestations, climate-related events (such as floods and droughts) for exploring memory and learning in the context of adaptation to climate analogues, focus group discussion techniques (for exploring questions of power, history and mobility), key person interviews (to get at areas of political sensitivity or specialized knowledge) and the creation of seasonal rounds (for exploring temporal-spatial relations in livelihood patterns, as well as climate-related changes in seasonality, all related back to mapping activities to model spatial-temporal dynamics of the system).

For the sake of clarity in presenting the research approach, the following section systematically lays out the measures that are being taken to collect and analyze the data. While the steps are listed sequentially, it is important to note that in actual practice the research process is more iterative, with analysis of initial data being carried out in tandem with ongoing collection to allow for the revision of the research strategy, consistent with emerging theories, insights, and informational needs (Maxwell, 2012). An important feature of the qualitative research approach is the elasticity of its design, in keeping with its inductive nature. As with the overall content of proposal, the methods here put forward are regularly modified to take advantage of emerging relationships, opportunities, insights, and modified in response to a systematic process of reviewing both the quality and relevance of the data produced. Such a reflexive process of iterative research (re)design is consistent with best practice in qualitative social research and allows me to adapt my approach to suit the context, improving the overall quality and reliability of data produced (Hammersley and Atkinson, 1995).

DATA COLLECTION METHODS

Data is being collected at different scalar-hierarchical levels in order to gain a fuller understanding of the systems of interest, the bottom-up and top-down forces, identify and characterize the scalar dimensions of system processes, elucidate cross-scale linkages and interactions, and to gain a fuller picture of system function. I have disaggregated data collection approaches for each level (below) with sub-national and village-level research utilizing the same set of methods, adapted to the scale of each.

National-Level Data Collection

With a view toward situating my analysis of local level processes within these focal sites within broader discourses and political and programmatic contexts, the research process also included participation in national and international processes and events related to the governance of natural resources, relevant to the research sites. National-level data collection focuses on three approaches: textual analysis and archival research, key-person interviews and participant-observation in national-level meetings and policy-processes. National-level participation was more expansive, and varied by country. Semi-structured key person interviews involved selected individuals in order to solicit specific insights into events and processes that the individual is strategically positioned to provide (following the method of Lindlof and Taylor, 2002). This mode of data collection is also being used to address sensitive issues, such as those with political ramifications that cannot be openly discussed⁴.

⁴ Confidentiality and political sensitivity present systemic constraints throughout the research process. To some degree, individual interviews allow for the exploration of some topics which cannot be addressed in a broader discussion. Other considerations to manage this issue of political sensitivity are addressed in the section *Other Considerations*, below.

Selection criteria for key persons included those with privileged knowledge to specific events (Maxwell, 2012), those who were regarded by community members as having particular knowledge, a selection process referred to as “criterion-based selection” (LeCompte and Priessle, 1993), “purposeful selection” (Light *et al.* 1990), or “purposeful sampling” (Patton, 1990), or those who, during the research process, were identified by previous interviewees (so-called ‘snowball sampling,’ Goodman, 1961) or those judged to be able to represent a divergent viewpoint or competing explanation of events or processes (seeking maximum variation in the sampling process). At the national level, participants of key-person interviews were selected from government agencies, civil society organizations, donors, academics and others identified who have specific, privileged knowledge of events or other information pertaining to the research questions and the system(s) of interest.

In Laos, where the majority of on-the-ground research effort was spent, this included more than three years of active participation, including more than 30 senior-level⁵ meetings with government officials from more than seven Ministries and the Office of the Prime Minister, representatives of bilateral and multinational donors agencies⁶ and national and international NGOs. In Afghanistan, national-level involvement was primarily with the Ministry of Agriculture, Irrigation and Livestock whose mandate covered most of the natural resources sector, the US Embassy in Kabul and with various NGOs including the Wildlife Conservation Society and others. Regional engagements included active participation in the Forests Asia Summit in 2013 in Jakarta, and numerous regional meetings in Bangkok, Hanoi and Phnom Penh, primarily but not exclusively under the auspices of the World Wide Fund for Nature

⁵ Defining senior-level meetings as those chaired or hosted by Director General-level or above government officials

⁶ Including ambassadorial representatives of Germany, Japan, Finland, Australia, the US and others, as well as the World Bank, Asian Development Bank, United Nations Development Program, the Critical Ecosystems Partnership Fund and others

(WWF). These meetings provided much of the data used in discourse analyses (see below), contextual information on government policy and development strategies, and as a venue to develop individual connections for interviews with key informants (specified below).

At the national (or ministerial) level interviews were carried out with 22 government officials in Laos, and nine officials in Afghanistan, as well as 18 conservation and development experts in Laos, and eight in Afghanistan. In general, key person interviews allowed for more frank and (relatively) open discussions on sensitive topics, opportunities to solicit private opinions and insights of decision-makers and more precise information on topics not addressed in available documents.

Interviews were recorded through the use of a handheld audio-recorder (Sony ICD-P620 or similar) or, where the topic of conversation was too sensitive for recording, hand written notes were prepared, either during the interview or subsequently, in the case of particularly sensitive topics. As the majority of interviews will be carried out in Lao and Pashtun languages, audio recording of interviews will be preferable in order to avoid interrupting the flow of conversation (Barrett and Cason, 2010) and to enable the collection of “rich data” rather than the highly-summative data recorded by hand notation (Maxwell, 2012). All audio files and notes will be de-linked from personal signifiers in order to protect the anonymity of participants. While the interview guides will be tailored to the specific interview during the research process, the general content of the interview questions is presented below in Table 4, though the formulation of questions themselves during each interview event differ depending on the individual.

Textual Analysis and Archival Research

I review existing documents including government regulatory instruments through laws and other policies, published national strategies and development programs, etc., as well as other archival information (including cartographic resources, media publications and historical records), in order to explore historical-spatial dimensions of the systems of interest. Examples include maps of the Land and Forest Allocation and Land Use Planning processes (in 1990s and 2000s, respectively), policy instruments relating to swidden cessation, government-sponsored village resettlement activities, policies related to Protected Area Management, etc.

This information helps me to structure an understanding of the temporal dimensions of spatial resilience within the systems and how these historical pathways shape current spatial-power relations. Specifically, textual analysis and archival research will be used to:

1. Identify spatial dimensions of pathways created or shaped by historical policy instruments (including Land and Forest Allocation, Land Use Planning and other activities);
2. Assess discursive power as used in documentation (causes of environmental degradation or poverty, and proposed solutions);
3. Understand how ownership over space and access to spatially-distributed resources is conceptualized and legitimated, and how framings impact on boundary processes, tenure arrangements and the spatial dimensions of system components and processes;
4. Better understand spatial movement of communities and the space-time dependent relations of resource access, as well as the movements, processes and flows of the ecological sub-system.

Sub-National and Village-Level Data Collection

Data collection at sub-national and village-level was carried out through similar approaches, though adjusting for scalar differences. These approaches included community-led mapping activities, focus-group discussions, and key person interviews. Multiple communities⁷ within a single catchment are being engaged in order to develop a catchment-level analysis. This catchment-level analysis forms part of the sub-national research scale⁸.

Participant Selection

I selected individuals and groups of individuals deemed best-situated to provide information, commentary and insights on the components and processes of interest in the research, in much the same way that key persons were identified at the national level (addressed previously).

The selection of actor-categories was determined based upon the topic under discussion and the nature of the information sought. These groups included (not only) the village committee, community elder's group, occupational resource users (such as artisanal fishermen, occupational NTFP traders, etc.), local experts and historians, local religious leaders (such as spirit-doctors, mullahs, monks, etc.), and traditional medicine experts. In Laos, this included focal group discussions involving 403 individuals in Xe Pian NPA and 361 individuals in Xe Sap NPA, addressing issues of community livelihoods, local and traditional knowledge, threat analysis and issues of environmental governance. In Afghanistan this included 43 individuals who participated in 4 different research engagements.

⁷ Approximately 6-10 villages

⁸ While I have greater clarity at this stage regarding the scalar focus of research at the national level and at the level of the individual community, what is less clear is the actual composition or delineation of the meso-scalar 'sub-national' level. Aggregating information from several villages across a catchment to get a picture of system-processes at that level may be a way forward. This will be held provisionally for now.

Participatory Mapping

Recognizing the potency of spatial representation through cartography as a way of reifying and formalizing structures of power (Sletto, 2009), community-led participatory mapping of village areas, resources and ecosystems through spatially-explicit platforms (either virtual or physical) has been used as a means to ‘counter-map’ the place-claims and place-based understandings and identity of communities (DiGessa, 2008). Such processes of ‘agent-based modeling’ (Barnaud *et al.* 2011) are being used in the research to explore the spatial dimensions of the social-ecological system(s) of interest. These dimensions include:

1. The nature of system boundaries including administrative boundaries and possible contestation of these (including inter-village, District, Provincial or National Protected Area, and, at the sub-village scale, issues surrounding Land-Use Planning outcomes, all relating to possible changes in resource tenure regimes and access, influencing resources available for adaptation), relating to the mapping of power onto space; reference to research sub-questions 1 and 3.
2. Flexibility and overlap of these boundaries with resource uses (forest areas used for collection of NTFPs, important fisheries) and ecological system boundaries such as catchments, forest-types, etc.; reference to research sub-questions 3 and 4.
3. Identification and placement of important elements in the social-ecological system and their spatial relations (influencing distribution of climate change impacts, timing and directionality of system response to climate change drivers, etc.); reference to research sub-question 2.

4. The mapping of knowledge and system memory onto space (including locations of knowledge by actor group) and how this overlaps with tenure security and decision-making networks for adaptation; reference to research sub-questions 2 and 4.

Participants were asked to map out the area under discussion (typically done at the village level, though key person interviews may involve mapping out larger or smaller-scale spaces for specific purposes) including residential areas (including early settlements, and change over time), agricultural areas (and change over time), areas utilized for collection of NTFPs (by species, where possible), boundaries with other villages, national protected areas (where appropriate, or other state-controlled lands), areas which have been historically subjected to flooding or drought events, and other sites of importance as determined during the research process. Participants were then engaged in semi-structured discussions to explore questions of resource ownership and access, contestation, relationships along and across boundaries, historical changes and cultural meanings and ideas associated with their territory.

Maps used for the discussions were produced on large-sheets (A1 or A0) of paper and then transferred onto a georeferenced mapping platform through Quantum GIS (QGIS). In Laos, these were in some cases drawn directly onto laminated printings of orthorectified high-resolution aerial imagery⁹ produced through the 2010 aerial survey of the National Geographic Department.

Key Person Interviews at the Local Level

⁹ Both approaches have pros and cons. While high-resolution remote imagery may support dialogue by allowing the community and the researcher to visualize the space in question and the test the claims of participants against evidence (Lange, 2001), some have argued that such imagery may constrain consultation with community by presenting a time-specific snapshot of landscape conditions and uses (Barnaud *et al.* 2011).

Key person interviews were also carried out with village leaders and local experts such as traditional medicine experts and elders. In Afghanistan, engagement was somewhat different and changed throughout the multi-phased research processes. Starting from 2010 (during—though not included in—my MS research period) focal group meetings were held with tribal elders in undisclosed locations, involving 43 individuals, each participating four times in a sequence of meetings. Local-level data collection was carried out to address site-specific issues with local informants from 2010 to 2015, supplemented with extensive remote-sensing of the research area from 1998 to 2015. By 2014, tribal elders involved previously in the research had largely been killed or had fled from the research area as anti-government elements—first under the Taliban and associated groups, but by 2015 increasingly by Pakistani-supported groups self-identifying as ISIS—extended their territorial control. Subsequent research (2014 onward) relied increasingly on local informants (through email and Skype), remotely sensed data, published and unpublished reports available from the field, much of which was produced by the Afghan Research and Evaluation Unit (AREU) and David Mansfield, who has become increasingly involved in the research, carrying out on-the-ground data collection and carrying out interviews. Local-level information, as I have said, was at the center of the research, being used to understand local social and ecological events and processes, the meanings attributed to the events and perceptions of their local impacts, and to ‘get at’ various social dimensions of social-ecological change. In Laos, interviews and focal group discussions were audio-recorded wherever possible in Lao language and translated and transcribed by myself. In Afghanistan, translation was provided and hand-notes were taken during meetings.

Remotely-sense data was integral to all empirical papers. This included the acquisition of land use and land cover data (especially forest cover and change over time, agricultural expansion

events and, in Afghanistan, poppy cultivation), information on trails and road networks along border areas and logging events, among others.

DATA ANALYSIS

The analysis of data from national, sub-national and local levels, together with the information gathered from archival research, document analysis and map products, was integrated together to explore how processes at each of these levels interact to shape the resilience of the social-ecological systems under study. This analytic integration of diverse information sources involved the identification of key boundary formation process (NPA boundary demarcation, LFA and LUP events, etc.), analysis of the discourses frames used by different actors to legitimize both the need for these interventions and the spatial implications of these justifications, and the on-the-ground negotiation of these boundary processes between different sets of power-actors at the local level. Bringing these multi-scalar analyses together also involved the characterization of key system components and process in time and space and identification of how these spatial and temporal dimensions of power shaped the resilience of local social-ecological systems in the research areas.

Consistent with the qualitative research approach, data collection and analysis were carried in a concerted and mutually-reinforcing manner. Analysis of existing data is actively being used to inform ongoing collection efforts (including the sets of techniques used and the sources solicited). Specific analytical methods included data coding, fracturing and concept mapping and geospatial analysis through GIS-based platforms.

Coding of Interview and Focus Group Transcripts

Audio recordings of interviews were transcribed verbatim (either in whole or in part¹⁰, through my own interpretive translation) and, in most cases, analyzed using AtlasTi Qualitative Research software. Through this software, the transcripts were coded, categorized, and constructed into thematic groups and relationships for the purpose of constructing my theoretical understanding of the spatial (and temporal) dimensions of resilience. In keeping with the purpose of coding within qualitative social research, the intention here was not for ‘counting’ the prevalence of particular variables or responses, but rather for the purpose of “fracturing” the data to break it down into concepts and to reorganize these into emergent theories (Strauss, 1987) and analytic categories to feed into the theory building process (Charmaz, 2006). The specific codes used depended upon the categories that emerged during the research process, though in general these categories were both *etic* (as determined by myself, either of my own origin or categories derived from the literature), as well as *emic* (internally derived categories as framed by participants themselves) depending upon the content of the codes and their source of derivation.

Geospatial Data Analysis

Spatially explicit data presented through focus group engagement (participatory mapping activities, whether directly onto orthorectified aerial imagery or hand-drawn maps) were digitized within a GIS-based platform (QGIS) for integration with other spatial data such as time-series forest cover data (available for the years 1997, 2002, 2007 and 2010), administrative maps, existing Land Use Planning maps, etc. as available. The relationship between these overlays was analyzed for spatial relationships such as dissonance between community-identified

¹⁰ Partial transcription are used in cases where the discussion ranged off topic, irrelevant discussion occurred (such as interruptions during interview), or for sections of limited interest. Original audio recordings will be retained and systematically archived to allow for ‘checks’ against arbitrary selective transcription on my part.

boundaries and those officially used by government agencies, areas of contested ownership, spatial distribution of key species and ecosystem services utilized by communities and other users (potentially outside of the system), changes in ecosystem parameters over time (such as Land Use/Land Cover change, etc.).

Analytical Memos

In order to enhance and systematize the researcher-as-instrument, I continually monitored and recorded interior thought processes and emerging analyses through the use of Analytical Memos (Creswell, 2009). These either took the form of narrative ‘thought-pieces’ for those analyses which are relatively more formalized, or as ‘notes’ for nascent concepts, ideas, or possible relationships. Throughout all stages of the research period, written and audio analytical memos were taken, compiled and organized for subsequent retrieval in order to allow me to monitor the pathways of emergence for particular theoretical ideas and to allow me to ‘backtrack’ from dead-ends and impotent hypotheses. I used the practice of memo writing to enhance subsequent data gathering (Charmaz, 2006).

Concept Mapping

Similarly to the above, I monitored and reflected upon emerging insights into the theoretical relationships between system variables and processes through the use of Concept Mapping (Maxwell, 2012). The purpose here was to allow for visually representing possible connective processes between variables, to explore missing variables, concepts, and linkages, and to begin to formulate theory from the data. As with the analytical memos, and for similar reasons, I compiled and organized ‘draft’ maps.

OTHER CONSIDERATIONS

Political Context and Sensitivity

Laos is a single-party Communist state, governed at the highest level by senior officials who served as revolutionary leaders during the Indochinese War (intermittently, from 1945 to 1975). All media is state-owned and carefully censored, public gatherings are allowed only if organized by government officials, religious and political freedoms are heavily restricted. These political realities were important parameters within which my research was carried out. The Government of Laos manages interaction between foreigners and nationals, particularly in rural contexts, requiring specific field permissions for access to communities, the presence of a government representative during all engagements, and censure over the content of discussion. Questions regarding the use and abuse of state power (or the activities of politically powerful families), unless handled very carefully and discretely, were highly sensitive. Despite these restrictions, authentic and incisive answers to the questions raised in this research were critically needed in a context in which rural restructuring and the national development agenda have significant potential to exacerbate the impact of climate change on the portion of society least capable to adapt to it. In Afghanistan, sensitivities more often surrounded the conflict itself, concerns on the part of participants and researcher assistants regarding the ramifications of their involvement in the research.

In order to manage for these risks (both those risk arising from the political context as well as the risks of producing a superficial assessment of the research questions) I relied upon the following techniques: reliance on personal relationships with key individuals, embeddedness in credible institutions in order to situate the research within the national development process, obtain access

to rural communities, and procure protection for myself and research assistants, and sensitivity in the handling of research materials and writings.

Cultivating Relationships

Laos and Afghanistan are both highly-relational contexts. The operation of official regulations and activities of political structures are mitigated by relationships of (genuine, reciprocal) trust formed with individual actors within the system, complicated by armed conflict between government actors and some local participants in Afghanistan. Within the confidence of such relationships, issues of sensitivity may be engaged to some degree. Qualitative social research, perhaps more than any of the other sciences, is intrinsically relational in nature. The quality and reliability of the data produced from the research process depends upon the relationship between the researcher and the participants in the research study. Consistent with the relational nature of the research approach, specific focus was given to the cultivation of relationships with gatekeepers (those who can provide access to social and political networks, and provide protection during the research process) and research participants (Maxwell, 2012).

In the Lao context, the complexity of the researcher-participant relationship was further compounded by at least three additional factors. First, access to the participants themselves was granted or restricted at the discretion of government authorities (as mentioned above). Second, the linguistic and cultural barriers that existed between the researcher and the participants (in this case) required that the researcher acquire not only local language(s) but also is able to adapt to local norms and customs, ways of being and relating. Thirdly, participant communities have become accustomed to particular (uni-directional) modes of engagement with outside authorities. These modalities, typically characterized by the outsider as ‘knower’ and authoritative and the community as ‘non-knower’ and subservient were unsuitable to my research needs. In addition to

the need for developing rapport and trust with participants common to all qualitative social research, specific measures were taken to address each of these compounding factors. These measures included, respectively, the cultivation of relationships with government authorities who are able to grant permission for research access, the acquisition of local language through intensive study and prolonged field time with rural communities in the research area(s) and, finally, a specific emphasis on demonstrating respect, openness and a desire to learn from participant communities.

Insertion and Embeddedness

A core feature of qualitative social research (and one which distinguishes it from quantitative approaches to social research) is that it depends a great deal upon the direct, personal and subjective observations, inferences and interpretations of the researcher over a prolonged period. As such, it presents both a number of advantages, as well as a number of potential validity threats that are quite unique. The data of qualitative research comprises of a broad range of factors including, but not limited to, the words and behaviors of individuals as well as their social and biophysical contexts, all of which are processed through the researcher *who is* the research instrument.

In order to generate ‘rich data,’ my research strategy was predicated upon prolonged exposure to the structures, social institutions and interpersonal relationships within the research area and beyond through embeddedness within a locally-situated organization. In a complicated political context, organizational embeddedness provided access to research sites and legitimacy for my research activities.

In Lao PDR, I was embedded within the Ministry of Natural Resources and Environment (MONRE), serving as Senior Agriculture and Forestry Expert of the United Nations

Development Program (UNDP), with secondary affiliations with the Center for International Forestry Research (CIFOR) and the Worldwide Fund for Nature (WWF). In Afghanistan, DAI served as the hosting agency.

Conducting research whilst being embedded within an organization has strong precedent within overseas research settings, through it has been noted that there are also associated risks (Barrett and Cason, 2010), including the possibility that academic integrity is sacrificed in the interest of the organization (for example, where the research indicates non-positive outcomes of program activities). Care was taken to mitigate this risk by systematic peer-review (by unaffiliated researchers) of the data and my analysis during the research process, and maintaining my position as an independent contractor outside of the central structure of the respective institutions.

Seasonality and Field Access

An important practical consideration of my research approach was the seasonality of the monsoon climate and associated livelihood responses and labor-cycles amongst participating communities. In Laos, experience has demonstrated that from the beginning of the rainy season (approximately June within the study areas) until its end (approximately December), nearly all of the participants in the communities of interest do not reside within the village. Instead, they live for a period of several months beside their rice fields (this is particularly true in the case of swidden areas), sometimes several kilometers distant from the village center. Following the rains, several weeks of harvesting of rice commences. In December, the community members begin to return to the village and have the time available for engagement in the research. Given the constraints raised previously regarding the timing of project cycles, this seasonality of access to participants raises a further factor which plays an important role in determining the timing of

research activities. The research design accounted for this by focusing field research activities that involved broader participation from community members within the non-rice-growing period, with a more overt emphasis on key-person interviews, transcription, coding and analysis during the rice-growing phase.

In Afghanistan, seasonality was less of an issue, except that springtime (April and following) tended to be a time of heightened military conflict, presenting an obstacle to data collection during that period.

Use of Research Assistants

Research assistants supported various aspects of the study, especially during the collection of field data. Government staff of partnering agencies assigned to the project activities were utilized for data collection in Laos, while employees of the hosting agency DAI were used in Afghanistan. Research assistants were identified who understood the local area well and who were willing to engage with communities in a manner consistent with the research approach. Additional volunteer research assistants were selected from local and national academic institutions, with a focus on students who were studying relevant subject matter, and a preference for those who were local to the research area.

Since the quality of the data collected by the research assistants was partially a function of the quality of the assistants themselves (Barrett and Cason, 2010), measures were taken to ensure that they were properly trained and that careful, direct supervision was provided by myself throughout the research period.

VALIDITY STRATEGY

Unlike in quantitative research, validity in qualitative social research is less about verifying the conclusions of the research than about bolstering the case for the plausibility or accuracy of the findings against alternative, rival hypotheses or explanations (Campbell, 1998). While quantitative research seeks to control or limit validity threats through methodological approaches and controls, the strength of qualitative research rests both in its methodological flexibility as well as its use of the researcher *as the instrument* (with all of the faculties, intuitions and nuance of understanding inherent to the human person), requiring a different approach to the question of validity: one which focuses on systematic monitoring of subjectivity in order to maximize its strengths and minimize its weaknesses. The validity strategy taken for my research focused on the testing of emergent hypotheses against subsequent data, with final interpretation(s) being subject to a number of specific strategies designed to mitigate species threats to validity (detailed below).

Key threats included my own personal, intellectual or theoretical biases, reactivity of participants to the my presence, mode of data solicitation (particularly important in a cross-cultural context) or fears relating to the political sensitivity of the subject matter, and also threats to validity which might emerge from giving too much credence to data or insights derived from single sources, such as the so-called 'key-informant bias' (Pelto and Pelto, 1975). These potential threats to the validity of my findings were largely derivative of the very personal and subjective (whether my own or that of the participants) nature of the research and, as such, cannot be exorcised from the process (Maxwell, 2012). Rather, I systematically employed several measures through which to monitor and manage these potential threats. Measures taken to address these threats to validity included: long-term, intensive involvement in the research setting, the procurement of 'rich

data', participant validation (or member checks), looking for discrepant data or negative cases, and the triangulation of data through multiple approaches.

Long-term, intensive involvement

As mentioned previously, the qualitative and inductive approach depends upon close, prolonged and personal interaction within the systems of interest as well as the higher-order contexts within which these systems are situated. The long-term involvement of researcher within these systems allowed for a more nuanced interpretation of the meaning and implications of particular events, discussions, or other pieces of data, as well as greater capacity for identifying possible 'outliers'. By situating myself in-country throughout the research period, with as much direct interaction within the specific villages under investigation and key actors as possible, I sought to limit threats to validity which might stem from hasty conclusions or generalization from isolated conversations or events.

Rich data

Closely related to the above, the generation of 'rich data' (thoroughgoing discussions rather than soundbites, the recording of a series of related events rather than individual instances, etc.) is enabled through prolonged exposure and an in-depth understanding of system dynamics. The acquisition of such data allows for greater validity in the analysis of research results and was employed in my research in order to allow for a more nuanced and credible interpretation.

Participants Validation (member checks)

Because of the central importance of understanding not only the objective 'data' of events and discussions, but also the significance and meaning which research participants attach to these events and discussions, I used participation validation, or "member-checks" as much as possible

in order to allow participants to (dis)confirm the accuracy of my recorded data (particularly since this is being done through a second language) and the plausibility of my interpretation. This validity strategy provides a further benefit consistent with my worldview which regards the empowerment and full participation of respondents as active subjects—and not objects—of the research process. Member-checks not only allow an opportunity for participants to review the accuracy of my work, but also an opportunity for further discussion regarding my interpretation, and the production of more ‘rich data’.

Looking for discrepant evidence or negative cases

Key to subjecting my research to the scrutiny of validation is the exploration of possible counter-explanations and discrepant cases (Maxwell, 2012). The identification of such cases or data, and the adjudication of these as being substantive enough to justify re-consideration of my interpretation or not, is being actively employed throughout the research process in order to develop a more robust conclusion. While the search for discrepant information is carried out during the review, coding and analysis of data (that is, looking for discrepant cases within the dataset), I will also actively seek out possible cases and or sources of data which might be expected to provide information which contradicts my previous findings (such as a politician known to have a divergent position than previous respondents, or set of individuals which might benefit from livelihood activities otherwise regarded as harmful to social-ecological system resilience, etc).

Triangulation

Triangulation—the process of finding two (or more) additional sources which shed light on a different angle of the same information, providing either (dis)confirmation or nuance—has long

been standard within the qualitative research tradition as a means of counteracting the likelihood of certain biases (such as key-informant bias). I employ this strategy in order to avoid such systematic biases in my research and also the possibility of systematic biases leading to a triangulated—but still incorrect—interpretation of the data.

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CHAPTER 3: THE POWER PROBLEMATIC- EXPLORING THE UNCERTAIN TERRAINS OF POLITICAL ECOLOGY AND THE RESILIENCE FRAMEWORK

ABSTRACT

Significant and growing concerns relating to global social and environmental conditions and processes have raised deep questions relating to the ability of traditional governance regimes to manage for the complexities of social-ecological systems. The resilience framework provides a more dynamic approach to system analysis and management, emphasizing nonlinearity, feedbacks, and multiscalar engagement along the social-ecological nexus. In recent years, however, a number of scholars and practitioners have noted various insufficiencies in the formulation of the resilience framework, including its lack of engagement with the dimensions of power within social-ecological systems, which blunt the analytical potential of resilience and run the risk of undermining resilience-based management objectives. In this analysis, we engage with this power problematic by drawing on key insights from the scholarly tradition of political ecology, suggesting that a more appreciative, thoroughgoing engagement between resilience scholarship and political ecology may allow not only a deeper treatment of power within the resilience framework but also address several important critiques of political ecology itself. We explore the shared intellectual spaces of these traditions and suggest some ways in which a critical engagement between resilience and political ecology on the subject of power better informs our understanding of socio-political dynamics within complex systems. In closing, we train the critical light backward on political ecology to suggest that an appreciative engagement with the resilience framework may assist by reasserting a more serious treatment of ecology within political ecological analyses and support the formulation of

more elegant, politically tractable counter-narratives to address global environmental crises.

INTRODUCTION

Global environmental change, the persistence of endemic poverty, and warnings of heightened tensions surrounding resource scarcity draw attention to the potential failure of contemporary governance regimes to manage the complexities of the biospheric system. This in turn raises questions about the sufficiency of our dominant political and programmatic prescriptions to address these urgent threats (Escobar 1999). The failure of contemporary governance regimes to successfully manage for change has been attributed by some scholars and practitioners to the effects of equilibrium and steady-state models which underlie global natural resource governance regimes (Arrow et al. 1995, Berkes et al. 2000, Folke et al. 2002). As such, the case can be made for new governance paradigms founded on far-from-equilibrium approaches to complex systems' management. The resilience framework for the management of coupled social-ecological systems provides one such alternative paradigm, emphasizing non-linearity, the importance of multi-scalar feedback mechanisms, and a more dialectical understanding of social and ecological processes. Both as an analytical framework and as a mobilizing metaphor, resilience has been taken up within policies and programs across a number of sectors and geographic contexts (Bahadur et al. 2013) as what might arguably be considered the leading counter-narrative for resource governance regimes across the world (Nelson et al. 2007, Walsh-Dilley et al. 2013).

Despite its prominence amongst some scholars and practitioners, the resilience framework has met with a number of critiques which suggest that current formulations of the framework are insufficient to engage with the complexities of social system dynamics (Davidson 2013) and

ineffective at addressing core social science concepts (Duit et al. 2010). Critiques of the application of the resilience framework within socio-political contexts emphasize limitations based on its descriptive, analytic, and normative dimensions (Barrett and Constanas 2013, Evans and Reid 2014). Key (and closely related) critiques relate to its tendency to assume or imply causal determinacy, its de-privileging of the role of individual and social agency (Adger et al. 2001, Davidson 2010), its insufficient engagement with the role of power in shaping social-ecological outcomes (Adger 2001, Davidson 2013, Cretney 2014), that the conceptual framing of resilience is not pro-poor (Béné et al. 2012) and broader questions relating to the assumed consonance between social and ecological structures and functions (Welsh 2014). Taking these critiques seriously, we focus attention on a core objection relevant to each: that the fundamental assumptions of the resilience framework are naïve about—or even perhaps unable to engage with—the workings of power (Walsh-Dilley et al. 2013). Power, as treated within the social science disciplines, has been defined and conceptualized in diverse ways. It is therefore useful here to define what we mean by ‘power’ for our purposes here. Paulson and others (2003: 205) provide a definition of power as it operates across the nature-society nexus as “a social relation built on an asymmetrical distribution of resources and risks... [located in] the interactions among, and the processes that constitute, people, places and resources.”

Several authors have recently begun to explore voices outside of the traditional canon of resilience scholarship that might aid in addressing this power problematic within the resilience framework. In these explorations, political ecology has emerged as a potential source of new insights and concepts that might enhance understanding of resilience within complex systems. Peterson (2000) presented one of the earliest explicit engagements, suggesting that resilience might benefit from political ecology’s engagement with power in social systems and, conversely,

that concepts in resilience could be used to address political ecology's underdeveloped theorizing with regard to ecological system processes. Some subsequent scholarship has explicitly focused on such cross-fertilization, exploring how political ecology might help elucidate the functions of power in entrenched top-down governance structures in common property management (Armitage 2007), enable a stronger analytic focus on individuals and allow for more politically sensitive understandings of social processes (Fabinyi et al. 2014). In another example, Turner (2013) explored the possibilities of a limited alliance between political ecology and resilience, suggesting that land-use ecology may serve as a possible point of constructive engagement. In this paper we suggest that despite these credible engagements we still lack a more thoroughgoing exploration of the terrains of these two areas of scholarship, and that such a deeper engagement is not only warranted but necessary. To this end, we will map out some broad territories of these traditions, emphasizing both the shared spaces of each discourse as well as those areas of divergence. We will then train a critical light on resilience, proposing a number of areas where political ecology brings new voices and insights to resilience's engagement with power and, in the final section, briefly train the critical light backward upon political ecology, suggesting some ways in which resilience thinking might usefully contribute.

THE RESILIENCE FRAMEWORK

The social-ecological resilience framework focuses attention on the function of complex dynamic systems, thresholds, non-linear interactions between social and ecological system variables, inter-scalar relations and how long periods of gradual, slow change interact with periods of rapid change (Holling 1973, Peterson 2000, Folke et al. 2002). Within such a conceptualization, large-scale, slow variables and disturbance regimes condition the parameters of the social-ecological system, while smaller, faster cycles and processes create disturbance,

variability and innovation (Berkes et al. 2000). These dynamic, interactive and multi-scalar processes produce a ‘stability landscape’ (Gallopín 2006) comprising of a number of possible alternative configurations, each with its own stability domain, allowing for dynamism between stasis and change and the basis for the system’s adaptive capacity (Folke 2006). The mechanisms conferring resilience to a particular system, then, are those that enhance the ability of the system to negotiate change dynamics across this stability landscape, to reorganize following disturbance events and to ‘learn’ and adapt through time (Carpenter and Folke 2006). Some key attributes understood to condition resilience in complex social-ecological systems include diversity (allelic diversity as well as the diversity of species, functional groups and institutions); heterogeneity (including, for example, landscape mosaics, habitats and knowledge systems); the degree to which the system fosters innovation and learning; feedback responses between ecological signals and social responses; retention of system memory (such as through seed banks and nutrient sinks in the ecological subsystem or through formal and informal history, cultural norms and indigenous knowledge in the social subsystem); self-organization rather than externally-forced organization (Carpenter et al. 2001); and the nature and structure of cross-scale influences (Folke et al. 2002).

The resilience framework has broad, intuitive appeal and has contributed to our ability to conceptualize complex social-ecological systems and derive more nuanced management prescriptions that incorporate insights about complex systems functioning and help to address problems of global environmental change (Berkes and Ross 2013, Brown 2013). However, the emergence of the resilience framework from largely ecological roots has shaped the ways in which it allows us to perceive the social dimensions of complex systems (Miller et al. 2010),

producing clear insights in some areas whilst obscuring insights into others, all with important implications for resilience-based management (Armitage et al. 2012).

Central to this issue, as we have said, is the marginal role that power has played in the resilience framework, which has tended to regard questions of power and legitimacy as being largely outside of its purview (Cote and Nightingale 2012). De-privileging the importance of power relations in social-ecological systems—or simply not getting them right—not only blunts the analytic potential of the resilience framework with regard to social and ecological system functions but also, in its practical application within real-world contexts, runs the risk of producing outcomes at variance with its intentions (Zimmerer 2006). In turn, this may discursively aid and abet inequitable governance structures and asymmetrical relations of power (Plummer and Armitage 2007, Cannon and Muller-Mahn 2010, Okereke and Dooley 2010). Questions of power also problematize the notion of resilience as an inherently desirable, normative goal for society (Engle 2011) recognizing that, for example, inequitable and oppressive governance regimes may certainly be resilient without being, by broad social consensus, ‘desirable’ (Carr 2008, Olsson et al. 2014). Even the largely positive concepts of adaptation and transformation—highly suggestive of change away from undesirable systems—are by no means immune to co-option by powerful actors who also use such mechanisms to entrench and protect their interests or social legitimacy when these become untenable under existing social or ecological conditions (Davidson 2010, Brown 2013, Béné et al. 2014).

“Resilience is a power-laden framework,” observe Cote and Nightingale (2012: 484) “that creates certain windows of visibility on the processes of change, while obscuring others.” Such selectivity with regard to the relations of power within nature-society interactions may be usefully thought of as conjoining ‘sins of commission’ (the potentially dangerous logical

fallacies and incoherencies underpinning the way resilience treats power and apprehends its function in social-ecological systems) with ‘sins of omission’ (where the resilience framework is simply silent with regard to the role that power dynamics play in structuring these functions). While disaggregating along this distinction is a useful way to frame our critique of the treatment of power within the resilience framework, this distinction in some sense breaks down when we recognize that both silences with regard to power and misconceptions of it are nevertheless highly problematic.

TRADE-OFFS IN RESILIENCE

The functions of power within the governance of social-ecological systems become perhaps most critical when trade-offs—in the broadest sense—are conceptualized, framed and negotiated (Wolf and Allen 1995, Miller et al. 2010). It is axiomatic that there will always be winners and losers from the processes and outcomes of environmental governance in general (Adger 2003) and during periods of system change in particular, wherein the interests of some actors are privileged over the interests of others (Adger 2001), raising social and normative questions of legitimacy (Brown et al. 2013) and technical questions regarding the differential costs and benefits accruing to social versus ecological system components. There exists a great deal of uncertainty regarding the content and magnitude of these trade-offs (Agrawal and Redford 2006) and the emergent impacts exacerbated by the irregularities of global environmental change and the diverse ways in which the adjudication of these trade-offs is negotiated through relations of power (Hirsch et al. 2011). While dynamics of power and questions of deliberative and distributive justice already plague current social problems arising from the relative scarcity manifest within current resource systems, global environmental change threatens to exacerbate these problems by presenting the real possibility of global scarcity in absolute terms (Davidson

2013) as systems are unable to provide for the needs of all (Kasperson et al. 1996) prompting the fundamental question “resilience for whom?” (Lebel et al. 2006). In light of all this, it is necessary that resilience science takes seriously the operations of power along the social-ecological nexus. these trade-offs by actively interrogating the ways in which these (and other processes along the social-ecological nexus) are filled with power relations.

A reformulation of the resilience framework that more adequately incorporates a critical approach to understanding power—its origins, exercise and effects—will allow it to more effectively engage with the increasingly complex and inter-related systems and effectively adjudicate the diverse and contested claims of various stakeholders at multiple spatial and temporal scales (Brown et al. 2013) who may hold different perspectives on what constitutes the appropriate objects and goals of resilience (Coulthard 2012). Political ecology, to which we now turn, provides us with some of the tools that may support such a reformulation.

POLITICAL ECOLOGY

Given the complexity of the various traditions and scholarly contributions that comprise political ecology, arriving at a coherent and comprehensive definition is a somewhat synthetic task. The earliest (and perhaps most overtly Marxist) definition offered by Blaikie and Brookfield (1987:17) explains "the phrase 'political ecology' combines the concerns of ecology and a broadly defined political economy...[and] the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself. We also derive from political economy a concern with the role of the state. The state commonly tends to lend its power to dominant groups and classes." Subsequent and potentially useful contributions to this early definition of the field have emphasized, variously, its material dimensions relating the

struggle over resources and the constitution of a politicized environment in the Global South (e.g. Bryant 1998) and its emphasis on how power asymmetries are expressed in, and supported by, discursive struggles over meanings in history and biology (e.g. Escobar 1999). A more recent definition emphasizes both the material and discursive tendencies of the field: “[Political ecology is] concerned with tracing the genealogy of narratives concerning the environment, with identifying the power relationships supported by such narratives, and with asserting the consequences of hegemony over, and within, these narratives for economic and social development, and particularly for constraining possibilities for self-determination” (Stott and Sullivan 2000). In short, political ecology is fundamentally about the role of power along the social-ecological nexus.

Despite the broad extension of the term and its introduction to a diverse set of sub- and related disciplines, there remains a set of core concerns common across much of the political ecology discourse, centering on the dialectical relationship between nature and society (Watts 2009). Core assumptions include (1) that there is an unequal distribution of both the costs and benefits associated with environmental change, which reproduces the structural power asymmetries which were the cause of these differential distributions (Okereke 2006) and, relatedly, (2) environmental degradation is both the cause and result of social marginalization, wherein asymmetrical relations of power exacerbate degradation through pressures of production on the natural environments of the poor and powerless (Paulson et al. 2003).

Despite important differences, the historical developments of political ecology and the resilience framework provide a legacy of some shared concepts and analytical approaches. Articulating the dialogic territory between political ecology and resilience requires that we map out the intellectual spaces of each, relating to the common focal topics of interest, research purposes,

and the ways in which each engage with complex systems. Both political ecology and social-ecological resilience focus their attention explicitly on the nature-society nexus as a core interest (Zimmerer 2007) and, while each tradition articulates the relational processes operative along this nexus in different ways, the conceptual similarities are great enough to allow for a degree of mutual intelligibility. Social-ecological resilience conceptualizes social and ecological elements and processes as constantly interpenetrating and articulates this relationship in the language of systems thinking, political ecology regards social and ecological relations similarly, as dialectical and mutually constitutive. Paulson et al. (2003: 210), for example, assert that core to political ecology is the commitment to “account for the dialectical processes through which humans appropriate, contest and manipulate the world around them, and to understand and act on the ecological and social impacts of those processes”—an objective very similar to that of social-ecological resilience. With regard to systems thinking, political ecology and social-ecological resilience both reject Clements’ (1936) model of ecological succession (Sayre 2008), understand human and ecological systems as complex and dynamic (versus linear, or reducible), tend to hold non-equilibrium understandings of complex systems function (Walker 2005) focusing their attention on drivers of system disturbance rather than forces of stasis, and engage with systems in explicitly multi-scalar ways (Ferguson and Derman 2005).

Mapping out these shared conceptual, analytical and methodological spaces is as important for demonstrating their intellectual commonalities as for casting in relief (if you will) their key points of divergence. First, where social-ecological resilience has tended to regard questions of power as largely outside of its purview, political ecology situates such questions at the core of its analysis. Second, and related, where social-ecological resilience focuses on the system as the basic unit of analysis and thus casts disturbances as generally exogenous to the system of

interest, political ecology also attends to the conditioning effects of endogenous system dynamics, such as the power asymmetries that produce vulnerability through the “everyday marginalization” of poorly-positioned actors (Gaillard 2010). The intellectual borderlands shared by these traditions facilitate interdisciplinary dialogue (i.e. allow them to talk to each other) whilst the key points of divergence provide impetus for critical engagement (i.e. give them something important to talk about). At present, however, underdeveloped theorizing with regard to questions of power in the resilience framework has contributed to mutual misunderstanding (i.e. talking past each other) and truncated co-analysis. What is critical for our purposes here is that engaging with questions of power in complex systems is not merely a case of introducing yet another variable into the already complex analyses provided by the resilience framework. Rather, as we will explore below, a meaningful engagement with the claims and insights of political ecology not only allows for the possibility of a more nuanced and informative conceptualization of system process, but may in fact change the picture entirely (Massey 1999) by radically recasting the analyses and prescriptions of resilience thinking’s comparatively unproblematized narratives (Walsh-Dilley et al. 2013).

A dialogic lynchpin between resilience and political ecology is the issue of power. In the sections that follow we will explore some ways in which the construction and function of power—as articulated through political ecology—problematizes some of the core notions of the resilience framework and how these problematic elements may be addressed. While certainly not an exhaustive treatment of resilience through the political ecology lens, we will seek to illustrate some of the kind of insights that political ecology might bring to resilience thinking. First, we will treat some of the ways in which power constructs knowledge of and within social-ecological systems, followed by some exploration of how knowledge-power is codified in policy discourses

and, finally, how these constructs shape the political dimensions of scale within the resilience framework.

POWER, KNOWLEDGE AND DISCOURSE

The governance of social-ecological systems is contingent upon the processes by which knowledge is generated, codified and brought to bear on the problems and solutions of management. These social processes underlie our ability to understand system dynamics, locate and describe the origin and nature of disturbances, and structure and implement appropriate management interventions. In the resilience framework, knowledge tends to be codified in scientific assessments, referenced in determining appropriate (and usually ecologically based) scales of analysis and actions, and brought to bear in adjudicating the appropriate mechanisms of adaptive management. Resilience thinkers have noted analytical biases introduced by the uneven distribution of knowledge, such as the irregular availability of data sets (Cumming 2011), and have noted the possibility of non-western epistemologies (Berkes et al. 2000). However, comparatively little critical attention has addressed why these data biases exist or what powers are implicated in the differential distribution and credibility of divergent knowledges. For political ecology, by contrast, these questions are crucial to understanding the relationship between knowledge and power, which are understood to almost universally overlap (Flynn 2007) and play a central role in structuring the truth regimes that undergird governance of society-nature relations and shape social and ecological outcomes (Bryant 1998). Central to this analytical focus is the notion that environmental knowledge is not only an object ‘out there’ to be grasped but also a social construction. Said differently, environmental knowledge as apprehended by political ecology is not merely a content or a set of data points, but an emergent property of the formal and informal, discursive, relational and dialectical interactions of society

and nature (Wolf 2011) conditioned by the asymmetrical relations of power which are transmitted and reproduced by it (Foucault 2007). That different actors in society possess differing degrees of knowledge and contest various theories or conceptualizations of social or ecological system processes is hardly contestable and well within the realm of resilience thinking, but what is not adequately engaged are the key questions: “who is allowed to the table in negotiating these contestations?” and “who is allowed to utter the definitive statement in a controversy?” (Flynn 2007:61); in short, “whose knowledge counts?”(Chambers 1997). Divergent knowledge regimes arise not only from differential access to knowledge but also from the multiplicity of rationalities (the Foucaultian ‘polyhedron of intelligibility’) emergent from the perspectival and situated nature of knowing (Escobar 1998). Exploring this relationship between knowledge/power, diverse rationalities and situated knowledges—interrogating their points of coincidence and divergence—is much more than an exercise in epistemology; it becomes critical when it comes to deciding the “right way of doing things” in the projects of environmental governance (Cote and Nightingale 2012). Taking these insights seriously within resilience-based scholarship would involve active consideration of the kinds of knowledge that are (or could be) brought to bear in the analysis of social-ecological systems and the dimensions of power through which these knowledges are constructed and (de)legitimized. It also involves interrogating how the invocation of various knowledges within analysis and management decisions shape the distribution of costs and benefits within the system. Power-filled constructs of knowledge materialize in the discursive structures that frame analyses and their associated prescriptions for strengthening resilience in social-ecological systems. Unpacking these discourses entails a careful analysis of their content, the relations of power that produce this content, and their material outcomes within real-world systems. This process—discourse analysis—is a useful

contribution from the toolbox of political ecology that can enable resilience thinking to interrogate how power functions to structure environmental knowledge within social-ecological systems and to what effect (Arts and Buizer 2009).

Exploration of the “unique discursive physiognomy” (Foucault 2007) of environmental discourses has been central to political ecology since its origin in the work of Piers Blaikie (1985). Since that time, exploration of the role of language in politics (Hajer and Versteeg 2005) has, for example, produced compelling insights into the ways in which environmental narratives have functioned as framing devices to legitimate the interventions of state actors and international agencies and thus the expansion of governmentalizing projects of the state.

A specific example might be helpful here. Shifting cultivation is a livelihood system that both forms the basis of local livelihoods for upland communities and poses a risk to, among others, timber and forest carbon values of interest to the state. Ingalls and Dwyer (2015) argued that while shifting cultivation within a protected area in Lao PDR formed the basis of complex social-ecological landscapes and a key adaptive strategy of local communities, it nevertheless has become the primary target of Reduced Emissions from Deforestation and Degradation (REDD) programming. By invoking a long-standing, and scientifically ambiguous, environmental narrative that discursively casts shifting cultivation as ‘backward’ and environmentally destructive, state authorities were able to legitimize interventions to conserve one specific environmental value—standing forest biomass—at the expense of broader social-ecological functions. Locating the cause of environmental degradation in the inadequate practices and knowledge of the poor (Basset and Zueli 2003), creating simplifying narratives of the social and ecological worlds of their subjects that ignore local agency and eliding complex social-ecological realities (Barney 2009) allows these narratives to legitimize the

reterritorialization of local resources (Brogden and Greenberg 2005). This is accomplished via enclosure of the commons by the creation of protected areas (separating “peopled spaces” from “nature spaces,” Baird 2009) and other forms of appropriation (Peluso and Lund 2011).

While the exercise of ‘raw’ or ‘elemental’ power perpetrated by governments, militaries or corporations (for example) may bring about the accumulation of resources through dispossession, such actions are short-lived where they are not able to construct plausible narratives that legitimize their actions. Another example, taken from the same region, may be helpful here as well to illustrate that even overt seizures of territory may nevertheless be couched in such legitimizing discursive framings. The creation of protected areas and other political forests in former Indochina took place within broader socio-political processes of state formation, insurgency and border conflicts during the latter half of the 20th Century. Dwyer and others (in press) show how in Lao PDR, long after these security issues were resolved but in a time of rising demand for high-value timber species and increased pressures from cross-border logging, historical legacies of border insecurity and counterinsurgency have been invoked by contemporary military actors to appropriate forest resources within protected areas and exclude local communities. By casting transboundary logging operations as not only environmental threats but also risks to national security and the political forest estate, military actors were able to politically legitimize these appropriations, despite their overt economic intent.

What is critical here is that discourses are words, but they are not merely words. They are political constructs of power that legitimize certain policy orthodoxies and materialize in laws and programmatic prescriptions with practical and material outcomes (Arts and Buizer 2009) along the society-nature nexus. In so doing, they play a key role in formulating and justifying policy prescriptions that condition the resilience of social-ecological systems. By failing to

carefully interrogate constructed environmental discourses, the resilience framework runs a substantial risk of ignoring (or worse, supporting) the accumulation, dispossession and appropriations legitimized by them. More care could be taken within resilience-based analyses to interrogate the ways in which various actors define environmental degradation and ascribe the causes of these processes, asking “who stands to gain or lose from particular environmental narratives and from the proposed corrective interventions?”

POWER AND THE POLITICS OF SCALE

Another area wherein political ecology may usefully contribute relates to the treatment of scale, an issue that is core to social-ecological analysis (Cumming et al. 2006). Resilience thinking has made the important point that environmental and social problems often occur because of a failure to address issues of governance at appropriate scales and that the spatial and temporal fluidity of heterogeneous social-ecological system dynamics requires equally flexible institutional arrangements (Carpenter and Brock 2004). Further, resilience recognizes that engagement at one scale cannot be done without paying proper attention to cross-scale dynamics, including the role of subsidies (e.g. through nutrient and species flows, or through the financial or human capital subsidization between scales, see Carpenter et al. 2001, for examples of the latter) that condition the resilience of systems (Adger et al. 2006) and, often, mask the impacts of system degradation (Cumming et al. 2006).

Taking these observations to a higher scalar level, resilience scholarship has observed that in a globalized world where actions are increasingly uncoupled from their impacts in space and time, and local decisions have intergenerational consequences, governance must transcend geopolitical boundaries to engage with the multi-scalar nature of social and ecological change (Peterson

2000, Jax and Rozzi 2004). While the appropriate scale of governance in social-ecological systems is, in some sense, global, there is an important sense in which analysis of the real-world implications of multi-scalar governance regimes is most appropriately done at the local-level where these processes produce their on-the-ground impacts (Adger 2001).

Resilience scholarship's recognition of the importance of appropriate scaling, the need for dynamic, spatially and temporally flexible institutions to manage the fluidity of complex social-ecological system functions and the conditioning effects of cross-scale dynamics are all important contributions to the governance of complex systems (and are somewhat underdeveloped within political ecology). Within these, however, still lacking are thoughtful analyses of how scalar decisions are made within resilience-based analyses and how these decisions play a role in shaping the outcomes of these analyses, all with implications for management. Rather than being a spatial object, scale is an analytic category that refers specifically to the "the spatial, temporal, quantitative and analytical dimensions used to measure and study any phenomenon" (Cash et al. 2006) or the spatial patterning of human-environment interactions (Zimmerer 2006). Said differently, scaling is "the act of defining the spatiotemporal level or levels of interest when attempting problem solving" (Wolf and Allen 1995:5).

Armitage and Johnson's (2006) analysis of resilience and globalization in two Asian coastal systems in the state of Gujarat, Indian and Central Sulawesi, Indonesia is illustrative. In both coastal systems, rapid economic transformations enabled by global market conditions have brought about substantial and potentially catastrophic changes in social-ecological conditions. The potential collapse of these local coastal systems points in one direction to a loss of resilience at the local level but also, in the other direction, to a robust global economic system which changes rapidly to exploit local resources, leading the authors to observe that resilience-

assessment depends largely on the focal scale of interest. The question of whether the system of interest is resilient is contingent on whether the local or global system is the focal scale of interest. This is significant because resilience-based assessments either implicitly or explicitly form the basis of policy prescriptions. The application of the resilience framework at one scale of analysis may suggest that certain policies or programs might strengthen resilience, while analysis at a higher level (such as in this case) may indicate precisely the opposite. Scanning across resilience-informed assessments suggests that this may be a persistent issue for the resilience framework. Not only do resilience-based assessments tend to focus on local-systems (potentially missing key global-scalar processes and outcomes) but they also seldom delve below them (Fabinyi et al. 2014), likely ignoring the ways in which the resilience of even local systems may be enabled through the loss of resilience amongst lower levels of analysis. Taking this insight from political ecology seriously entails that resilience assessments look more closely at how scalar decisions are made during analysis, what power processes are operative within these decisions, and how power may function across these scales to build or erode resilience. Analyzing the politics of scale—the power dynamics expressed in the selection of focal scale, scalar bounding and the impacts of these—requires that we recognize that scales of interest are neither given nor politically neutral (Castree 2004). They are social constructions that embody and express power relationships (Basset and Zueli 2003), are historically contingent and contestable. While the constructed nature of scale within social systems may be relatively more obvious, it is important to recognize the less obvious point that even ecological scales are socially produced. The analyst must (de)select from amongst nearly limitless ecological variables—a subjective selection that then determines the scalar frame of subsequent analysis. These selections are significant because system dynamics are inherently sensitive to changes in

analytical context determined by focal scale (Wolf and Allen 1995). System process-patterns that emerge at a particular focal scale may disappear, or even be contradicted, as we move from one focal scale to another, all with important implications for analysis and prescription. In the resilience framework, these scalar effects and their intersection with power become apparent, for instance, when the spaces of marginalized people become invisible at the focal scales of decision-makers (Adger 2003).

The selection of a focal scale, Sayre (2005) observed, has two moments—the epistemological (the point at which the scalar selection is made) and the ontological (the point from which the selected scale is treated as a given, or an objective feature of the focal system). Too often, the resilience framework passes from one moment to the other without mention. This elision may be a function of resilience’s rather deeper ecological (than social) roots—a history that produces one further weakness in resilience’s treatment of scale. The observation that scalar mismatch is “the most archetypical problem” (Cash et al. 2006) in the governance of social-ecological systems is a diagnoses for which is prescribed appropriately-scaled governance systems, meaning the scaling of social governance regimes to accord with the ‘natural’ scale of ecosystem processes. In this way, resilience prescribes, in an all-too-normative fashion, that it is ‘wrong’ to structure institutions of governance along non-ecological organizing principles (Cumming et al. 2006). Privileging ecological scale—and not recognizing that this scale is also a social construction—along western scientific categories may be problematic for a variety of reasons, not least of which in that it assumes non-ecologically-aligned jurisdictional or administrative scales are inappropriate for determining scales of environmental governance, though these may have—possibly very legitimate—rationalities rooted in their own antecedent social histories (Adger 2003). They may also ignore other spatial categories that may be far more salient to local

actors, such as connectivities along ethnic or tribal lines (Escobar 1998). Resilience may benefit from taking more seriously alternative (possibly non-ecological) social and cultural processes of scalar signification and recognize that scalar selection in the real world is always multivariate, adjudicated according to social, political and ethnic criteria as well as ecological ones, all of which are populated with the functions of (typically asymmetrical) power relationships. Resilience-based analyses, we suggest, may be enhanced by interrogating the subtext of scalar selections, asking: “who decides what the appropriate scale is, and of what?” “Who wins and who loses in these decisions?” “What are the political implications of social scaling processes?” While these questions have been lightly touched on within the resilience literature, which notes—at least in a cursory way—that subjectivity is involved in parameterizing and bounding complex systems (e.g. Cumming et al. 2005) or that scales are perceived and valued differently by different actors (Cash et al. 2006), these passing references are indicative of resilience thinking’s tendency to deprivilege considerations of power which otherwise figure prominently in the political ecology tradition (Armitage, 2007).

The political ramifications of scalar decisions are core to the resilience of social-ecological systems with very material outcomes, determining which processes are visible or invisible at any given scale (and, by implication, what drivers of change are important) and playing a formative role in structuring the differential distribution of costs and benefits within and across scales that vary with the scalar selection (Sayre 2005, Adger et al. 2006). Thus, where resilience analysts and practitioners invoke spatial dimensions that unwittingly draw on hidden (or unproblematized) power networks, they may produce outcomes that diverge from their intended impacts (Zimmerer 2006).

TRAINING THE CRITICAL LIGHT BACKWARD: RESILIENCE ON POLITICAL ECOLOGY

Recent scholarship addressing the shared, contested and divergent spaces of resilience and political ecology has tended to focus on the inadequacies of resilience in light of critical theory. A more productive and informed dialogue between the two requires a readjustment of this unidirectionality, and so we train the critical light backward, asking ‘what insights does resilience bring to political ecology?’ In this section, we very briefly identify some weaknesses of political ecology and suggest some ways in which social-ecological resilience may usefully contribute.

First, in its analysis of the nature-society nexus, political ecology has been criticized for its *a priori* assumption that factors of the political economy are not only influential in shaping social-ecological outcomes but necessarily dominate them (Vayda and Walters 1999) privileging politics at the expense of ecology (Paulson et al. 2005) becoming a “politics without ecology” (Walker 2005). To the degree that is true, it is not a trivial omission. Understanding the full ramifications of socio-political power asymmetries on the lived experiences of the poor and marginalized may not be possible without a deeper and more nuanced understanding of relevant ecological processes. Parsing the myriad causal processes within ecological systems—necessary for adequately understanding the implications of society-nature interactive effects—is a notoriously complicated endeavor. General assertions regarding the causes and consequences of environmental change and degradation in the absence of careful and theoretically-informed analysis may not be sufficient or, worse, may lead to significant misattribution of causes and effects. Second, political ecology has often been criticised for being long on critique but short on concrete, actionable recommendations and has thus enjoyed rather broader acceptance within the academy than outside of it. In so far as political ecology seeks to constructively address

disempowering policy narratives, the pro-powerful distortions of globalized market mechanisms, neoliberalist politico-corporate hegemony and other structures of marginalization it is necessary to move from critique to prescription. In some sense, political ecology has neglected its historical precedent in providing practical prescriptions emergent from its critical and potentially liberating counter-narratives (Gezon and Paulson 2005) by wilfully avoiding the “messy, constrained world [outside of academia]” (Piers Blaikie, personal communication, as cited in Walker 2006). To whatever degree political ecology has been unable or unwilling to gain traction amongst global policy processes, institutions and programming, it will be unable to fulfil this intention.

An appreciative scholarly-encounter with resilience may provide some direction for addressing these shortcomings. First, where political ecology may be lacking in nuance and analytic rigor with regard to its treatment of ecological system dynamics, resilience focuses attention directly on these elements and provides numerous tools not only for understanding the complexities of ecological processes but also for linking these back to social dynamics. A deeper understanding of multi-scalar ecological processes, thresholds, non-linearity and surprise—such as are elucidated within resilience-based approaches—will strengthen political ecology’s ability to more accurately and specifically interrogate the ecological implications of the political economy for the disempowered. Second, while political ecology has played an important role in critiquing dominant narratives of global environmental governance, resilience scholarship has been rather more successful in producing the compelling environmental counter-narratives to these approaches (such as historical equilibrium-based maximization assumptions) that have gained traction within the institutions and policy platforms of global decision-making. Constructive and forward-looking, resilience-based scholarship has positively (if sometimes naively) framed approaches of possibility, prescription and action for addressing the pressing issues of global

environmental change. This may—and, we think, should—prompt some useful reflection within political ecology. Critical theorists must be willing to explore political ecology’s own sins of omission and commission, and break out of the “verdant but largely peripheral pastures of academia” (Walker 2006:392), being willing to engage in the hurly-burly of the “messy” world of policy prescription and programmatic action.

CONCLUSION

The power problematic is, and will likely remain, a key issue for resilience science. For some, this signifies a fundamental and intractable flaw in its basic premise and core assumptions. We remain unconvinced. In our estimation, resilience scholarship’s sins of omission loom rather larger than its sins of commission, though both are tractable. Notwithstanding its insufficient exploration of these and other social dynamics, resilience remains a potent mobilizing metaphor (Pain and Levine 2012), a useful organizing concept (Brown 2013) and will probably continue to play a highly-visible role in global discourses of environmental and social governance, informing policy and practice. A particular strength of resilience-thinking rests in its ability to reframe existing theoretical constructs and analytic approaches, but this needs to be taken seriously and carried out with due diligence. Resilience stands to gain by more adequately educating itself in the insights of political ecology, directly engaging with the power problematic and, in so doing, may produce a much deeper and more radical critique of society-environment relations (Hornborg 2013). In particular, resilience scholarship may be enhanced by the politicization of its ‘givens’. Paying critical attention to the sorts of knowledge it privileges, the (re)production of these knowledges and their systematic invocation through particular discourses, resilience may gain deeper insights into the power dynamics embedded in such social and political processes and the ways these may intersect with resilience at multiple levels. Similarly, by paying critical

attention to its scales of analysis—how and by whom scalar decisions are taken and to what effect—resilience-thinking may be better positioned to understand how these processes of scalar signification elucidate or elide particular social processes and divergent interests.

Political ecology may also benefit from a more rigorous analytic framing of ecosystem processes and their intersection with social dynamics as a complement to its historically disproportionate focus on the political economy. Bringing together resilience's forward-looking and prescriptive approaches with political ecology's overt focus on power asymmetries, we have suggested, may be a boon for both, providing tractable and informed approaches to addressing pressing issues along the society-nature interface.

In this chapter, we have sought to point to a number of ways through which the power problematic may be more adequately addressed within social-ecological systems. More remains to be done both in fleshing out the theoretical footing of a 'political ecology of resilience' and in operationalizing these approaches within particular social-ecological contexts.

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CHAPTER 4: MISSING THE FOREST FOR THE TREES? NAVIGATING THE TRADE-OFFS BETWEEN MITIGATION AND ADAPTATION UNDER REDD

ABSTRACT

Forested landscapes play a critical role in mitigating climate change by sequestering carbon while at the same time fostering adaptation by supporting ecosystem services, the recognition of which is reflected in the recent Paris Agreement on climate change. It has been suggested, therefore, that the conservation of forested landscapes may provide a potential win-win in the fight against global environmental change. Despite the potential synergies between mitigation and adaptation efforts, recent studies have also raised concerns about possible trade-offs. Our research employs the analytic lens of social-ecological resilience to explore the intersection between mitigation and adaptation in the context of a Reduced Emissions from Deforestation and forest Degradation (REDD) project in Lao PDR. Drawing on ecosystem analyses, group discussions and interviews with policy makers, practitioners and resource-dependent communities, we identify three potential limitations of REDD for achieving climate synergies. First, by disrupting existing disturbance regimes, REDD interventions run the risk of reducing diversity and structural heterogeneity and thus may undermine functional redundancy core to resilience. Second, REDD-as-practiced has tended to select local, rather than structural, drivers of deforestation, focusing disproportionately on curtailing local livelihood practices, reducing local resources for adaptation. Third, REDD risks redirecting ecosystem service benefits away from local communities toward state agencies, incentivizing recentralization and limiting the scope of local governance. We argue that REDD's potential for delivering synergies between

climate change mitigation and adaptation in Laos is currently attenuated by structural factors rooted in development policies and broader political-economic trajectories in ways that may not be legible to, or adequately addressed by, current programs and policy.

INTRODUCTION

Leading up to the 21st Conference of Parties (COP21) in Paris, there was a growing consensus that climate interventions must seek not only to mitigate the extent and severity of climate change, but also support adaptation leading, in the final text of the climate deal, to an acknowledgement of ‘alternative’ Joint Mitigation and Adaptation approaches and the non-carbon benefits of reducing deforestation and forest degradation. This represents a significant step forward for while both mitigation and adaptation are about reducing the risks of climate change and thus share common long-term goals, they have seldom been brought together explicitly within policy frameworks (Biesbrook et al. 2009). The conservation of forested landscapes in the Global South has thus been highlighted as a way to bring together mitigation and adaptation for a win-win; mitigating climate change through carbon sequestration as well as ensuring the provision of ecosystem services that underlie the adaptive capacities of forest-dependent communities (see for example Locatelli et al. 2011; Mbow et al. 2014). There are, however, some obstacles (Moser 2012). In forest systems, important trade-offs may exist between carbon sequestration and biodiversity values (Gilroy et al. 2014), local livelihoods (Bluffstone et al. 2013) and tenure security for forest-dwelling communities (Awono et al. 2014), problematizing the notion of a simple win-win through carbon-based approaches to forest governance (Buizer et al. 2014; Klein et al. 2005).

In this chapter, we analyze synergies and trade-offs under Reducing Emissions from Deforestation and Degradation (REDD) within a forested landscape in the Lao People's Democratic Republic (Lao PDR or Laos) to ask in what instances proposed interventions for climate mitigation under REDD support climate resilience, and what circumstances are likely to produce conflict between these objectives? We focus our attention on how REDD is framed within the context of specific projects, not on what REDD says it will do in theory, thus making an analytic distinction between REDD-in-policy or rhetoric and REDD-as-practiced. This analytic dualism thus gives substance to the practical and material implications of forest governance through REDD (Arts and Buizer 2009). Interrogating the complex interactions between climate mitigation interventions and the adaptive functions of forested social-ecological systems, we draw on an analytic framework that conceptualizes this forested landscape as a conjoined social-ecological system, allowing us to go beyond dyadic trade-offs between individual system components (such as with biodiversity and carbon values) by elucidating those deriving from macro-scalar, interactive and dynamic processes that underlie the resilience of the system to climate change (Berkes et al. 2000).

Resilience in the context of climate change refers to the ability of a system to recover from and adapt to changing social-ecological conditions emerging from the interactive effects of both climate and non-climate drivers. Ecosystem services¹¹ provide the necessary basis for social-ecological system functions. The ability of ecosystems to provide these services under changing climatic conditions depends to a large degree on the ability of that system to respond (i.e. be resilient) to change drivers without loss of these service functions. Among other factors, climate resilience relates to the degree of diversity of system elements, allowing for functional

¹¹ Such as the provision of clean water, extractable resources of food and fodder, pollination and pest regulation, etc.

redundancy amongst species assemblages such that changes in species diversity or the loss of individual species does not affect ecosystem functions (Loreau 2004) and response-diversity (Goffman et al. 2006) in the face of changing climatic conditions. This functional diversity relates both to ecological elements (such as biodiversity) as well as social elements (such as diversified livelihood strategies).

In addition to diversity (and related to it), climate resilience is also supported by flexibility and mobility of system elements to adapt to spatially and temporally distributed impacts and resource abundance (Adger 2001) and to maintain desirable ecosystem service functions under changing conditions (Norstrom et al. 2014). Mobility and flexibility in ecological system components may involve migration or adaptation of species' range. In social systems, this may similarly involve migration and changes in use-environments for agricultural production or movement out of climate-impacted sectors. Resilience is a function, however, not only of these endogenous elements and processes but also exogenous forces, inter-scalar dynamics and macro-scalar change drivers rooted in environmental, social and economic processes (Carpenter et al. 2001).

Across these endogenous and exogenous factors, governance plays a key role in adjudicating trade-offs between various costs and benefits. In this, both the locus of decision-making and the structures of accountability that support it are critical. Devolved governance is in general believed to enhance resilience by positioning local resource users as central decision-makers (Adger et al. 2006), while transparent and equitable governance conditions foster social capital and positive norms of cooperation. A multi-country study, for example, found that the quality of governance (rather than technological or financial variables) was the most consistent predictor of national adaptive capacity (Berrang-Ford et al. 2014). Understanding how REDD programming

might impact climate resilience involves an analysis of how specific proposed interventions enable or constrain the governance dynamics described above.

Our analysis suggests that while REDD-as-practiced may achieve some synergies for climate resilience, its conservative and regressive application in practice may also undermine complex processes that foster climate resilience at the local level. By neglecting structural drivers of forest change rooted in the broader political economy and focusing unhelpfully on restricting local forest uses, current REDD programming may undermine elements of system resilience and thus achieve limited synergies with adaptation.

RESEARCH SETTING AND APPROACH

Our research focuses on a case study in the 1,498 km² Xe Sap National Protected Area (NPA), in the Annamite Mountain range along the border between Laos and Vietnam (figure 2). Xe Sap is located within Sekong and Salavanh Provinces in southern Laos, both of which were identified by Laos' National Adaptation Programs of Action (GoL 2009) as priority provinces due to high risks of climate change impacts such as increased mean annual temperatures and flood risks (GFDRR 2011). The NPA is largely forested comprising of a mix of Dry Evergreen Forest, Mixed Deciduous Forest, and areas dominated by tropical Dipterocarp species. It is significant for conservation and livelihoods values due to its unique ecosystems, high degree of biodiversity including a number of large mammal species of global and regional conservation significance (Timmins and Vongkhamheng 1996), and its substantial resources that support more than 15,000 individuals, primarily from the Pako, Katang and Tao-Oy ethnic groups.

In order to conserve Xe Sap and the forested landscapes which adjoin this area in Vietnam, the World Wide Fund for Nature (WWF) and the Government of Laos initiated the US\$9 million

transboundary Carbon and Biodiversity (CarBi) Project in 2011. As one component of this project, WWF commissioned the consultancy company Forest Carbon to undertake a REDD Feasibility Study using Voluntary Carbon Standards' (VCS) Methodology for Avoided Unplanned Deforestation. Remotely-sensed imagery was obtained from 2001 and 2011 in order to develop the baseline carbon emissions rate for the 10-year period leading up to the initiation of the study, supplemented by driver analyses and field visits with government officials.

Our research draws on WWF's (2013) Feasibility Study's identification of forest change, drivers, and proposed interventions. In order to set these analyses and proposed activities against the ecological dynamics of Xe Sap, we reviewed published and unpublished biodiversity and habitat surveys and species range studies carried out during the 1990s (particularly that of Timmins and Vongkhamheng 1996) and in the 2010s (Timmins and Duckworth 2013), as well as field surveys carried out by WWF staff during the CarBi Project. We reviewed sociocultural and economic data provided by government staff, local development workers and, especially, data procured during participatory rural appraisal (PRA) research carried out by Village Focus International (VFI) in ten villages within the NPA. PRA research involved household representatives and village leaders (n=282), identifying livelihood patterns, socioeconomic information on household incomes, resource governance and spatial patterns of use, and village histories. Oral data was collected through note-taking and flipcharts, while community maps were hand-drawn by community members and collected. We supplemented community data with semi-structured interviews involving government authorities (n=7) and conservation practitioners (n=10) which were carried out between 2012 and 2015. This data was analyzed to elucidate current livelihood strategies, drivers of change and existing and proposed mitigation activities and how these may interact with or shape the social-ecological system.

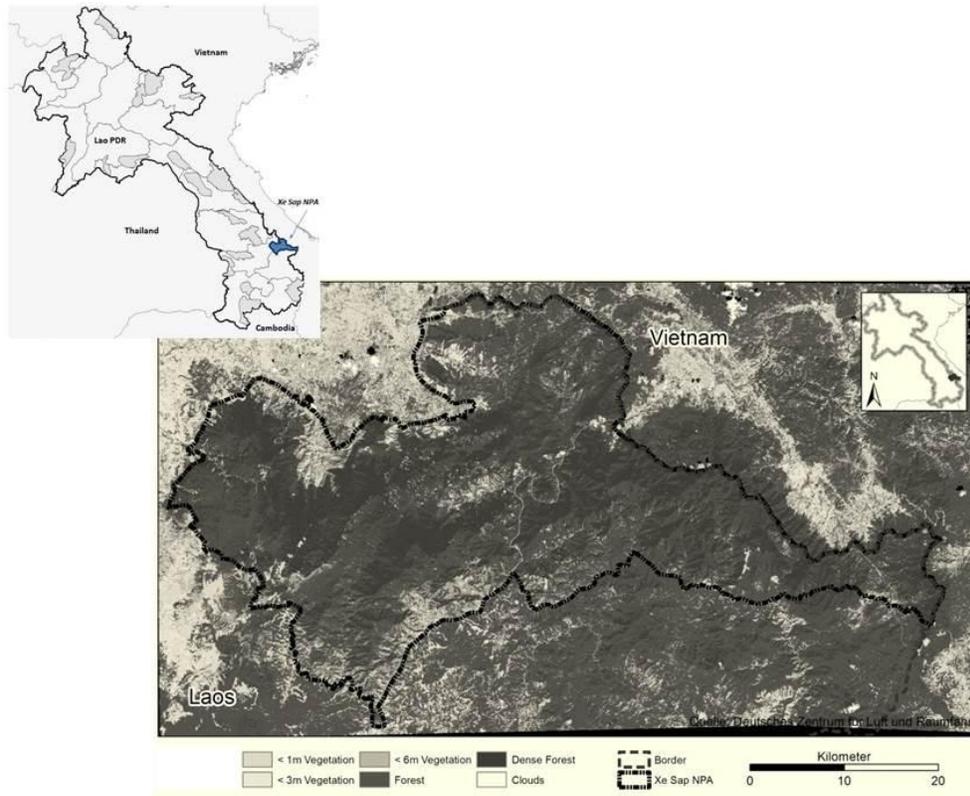


Figure 2: Xe Sap NPA Forest Cover

RESULTS

Local communities adjacent to and within the NPA exhibit a high degree of reliance on local natural resources, with 100% of local participants reporting that agriculture is their primary occupation. Rice, the staple diet, is largely procured through shifting-cultivation on communal lands along low and medium-elevation slopes and secondarily from privately-owned paddy fields along stream margins, supplemented through the management and collection of Non-Timber Forest Products (NTFPs). According to local communities, 121 animal species and more than 50 species of wild plants are used, distributed diffusely across portions of the NPA but

primarily within swidden¹² fallows and secondary forest mosaics. Remittances from economic migrations and the sale of NTFPs, poultry, small livestock and scrap metal remaining from the Indochinese Wars constitute the primary sources of household income, supplementing insufficient rice harvests and providing resources for expenses such as clothes, medicines and school fees. According to local participants, historic settlement patterns and the spatial dimensions of agricultural activities have been highly fluid. Village establishment, abandonment and relocation have been prompted by exogenous factors such as armed conflict during the 1960s and 70s and government resettlement programs aimed at eradicating shifting cultivation (particularly in the 1990s), as well as endogenous factors such as movements toward resource-rich forest areas. Communities reported that shifting cultivation takes place on a rotational basis in old fallows and secondary forests within village territories, often several kilometres distant from the village centres, intercropped with vegetables, herbs and other crops, with fallow areas providing NTFPs and wildlife for consumption and sale.

Mature, contiguous forests systems dominate upland areas. In 2011, mature forests constituted 81.4% of land area within the NPA, while fallow vegetation comprised an additional 16.6%. Analysis of RapidEye imagery indicated that while the amount of forest has decreased at an average rate of 0.28% per year since 2001, there has been a general increase in the rate of deforestation in recent years. During the period from 2010-2011 alone, the rate was closer to 0.43% (Bender 2013). While hydropower development, agricultural and mining concessions, and the expansion of road networks within and adjacent to the NPA were determined to constitute significant threats to forest conditions (WWF 2014) and causal factors displacing shifting cultivation into the NPA (for example, where communal agricultural lands in Atouk

¹² In this paper we use 'shifting cultivation' and 'swiddening' interchangeably.

village were given in concession to a Vietnamese rubber plantation company, local farmers had to clear land for shifting cultivation within the NPA, see WWF 2013), these were authorized by government authorities and thus did not constitute ‘unplanned’ drivers of deforestation under the selected VCS methodology as interpreted within the context of this project¹³. Consequently, the Feasibility Study identified shifting cultivation as the primary driver of unplanned deforestation, citing a draft of Bender’s (2013) logging study to support the contention that it accounted for up to 70% of total deforestation in Xe Sap. With a view toward curtailing shifting cultivation as the project’s selected driver of unplanned deforestation, the Feasibility Study recommended Land Use Planning (LUP), boundary demarcation, patrolling and law enforcement as the most efficient mechanisms to curb emissions and enhance carbon stocks. These mechanisms reduced the amount of forested areas used for shifting cultivation in favour of short-fallow swiddening and intensified, settled agricultural activities. In order to address drivers of deforestation resulting from planned events (those authorized by the state) that were not included in the proposed REDD project, WWF developed parallel activities including transboundary law enforcement, timber trade analyses, and protected area management. These complementary activities were funded by German government sources until the end of 2015.

In keeping with current government direction and common practice (see Dwyer and Ingalls 2015), the national-level Department of Forest Resource Management (DFRM) was identified as the proponent for this project¹⁴, though this has not yet been made explicit within the Feasibility

¹³ While the distinction between ‘planned’ versus ‘unplanned’ deforestation is critical within the VCS methodology—which seeks to avoid incentivizing intentional state-sanctioned deforestation that would drive up deforestation rates and thus potential carbon revenues—it is complex and debated. In the context of this feasibility study, and consistent with the way this is assessed in projects in Laos, ‘planned’ deforestation is considered to result from activities for which any written permission by government authorities is available, though it is often not possible to establish whether permission is consistent with law.

¹⁴ The agency responsible for delivering the proposed REDD pilot project, and also the primary beneficiary of revenues generated by the sale of carbon credits.

Study or associated project preparation documents. Potential revenue from the sale of carbon credits would cover the costs of management interventions and patrolling activities, which are currently infeasible given limited government financing, due to the remoteness of the area and the cost of access. Any funds remaining from these management activities and the costs of monitoring, reporting and verification (MRV) would presumably be used to compensate local communities, though this was not made explicit and no benefit-sharing arrangement was proposed.

Based upon current carbon pricing under the voluntary market, the Feasibility Study indicated that revenues from carbon sales would be insufficient to cover the costs of carrying out a REDD project and associated MRV. As of 2015, WWF has determined to delay proceeding with the proposed REDD project until carbon market pricing is sufficient to justify the investment, but has continued with REDD preparation activities and capacity building for government agencies as well as exploring alternative Payment for Ecosystem Services (PES) opportunities.

DISCUSSION

Synergies and trade-offs

The proposed REDD pilot project in Xe Sap NPA provides an opportunity for reflecting on the ways in which forest values and threats to these values are addressed within existing REDD practice and allows us to interrogate how REDD may shape the relationship between mitigation and climate resilience within a particular local social-ecological system. In addition to supporting climate mitigation through the enhancement of carbon stocks, interventions proposed to conserve forest biomass under the REDD pilot project in Xe Sap may also promote ecosystem services

such as water regulation and the diversity and abundance of those species suited to mature forest ecosystems. Potentially-improved water regulation by enhanced forest cover in select areas would be expected to buffer stochastic variation in precipitation patterns by mitigating the severity of both flood and drought periods for downstream communities, moderating climate conditions (see also Bonan 2008) and stabilizing sloping areas against landslides and catastrophic erosion¹⁵. Potential increases in the abundance of forest-loving species may support overall resilience and enhance the provision of some consumable resources for local communities during periods of food insufficiency resulting from climate-related disturbances to agricultural production such as floods and droughts.

While these co-benefits for adaptation in the project indicate potentially important climate synergies consistent with other studies (e.g. Guariguata et al. 2008), there may also be important trade-offs, which we explore below. First, by disrupting existing disturbance regimes stemming from shifting cultivation, proposed REDD interventions may risk undermining key processes underlying biodiversity and landscape structural heterogeneity. Second, we will look at how the selection of local drivers of forest change rather than larger structural drivers of change, potentially undercut opportunities for climate synergies by allowing business-as-usual forest governance. Finally, we discuss how REDD may undermine local governance by incentivizing (re)centralization by changing ecosystem values streams from largely local (based on current livelihood patterns) to carbon-based values accruing to the central state.

¹⁵ It should be noted, however, that the degree to which shifting cultivation results in increased erosion and sedimentation and negative impacts on hydrologic flows—and thus whether its cessation would result in enhanced water regulation—is highly contingent on field-level practices and alternative land-uses. Studies have noted that these negative impacts of swiddening tend to be overstated (see for example Forsyth 1996; 1999).

Disruption of shifting cultivation as a key disturbance regime

Within Xe Sap, shifting cultivation constitutes a key interface between social and ecological system components, supporting local livelihoods not only through the provision of rice but also through the provision of NTFPs. Shifting cultivation's cycles of production and fallowing provide a disturbance regime that has played a key structuring role in the historical ecology of the system (see also Turner 2005), maintaining a mosaic of cropped and fallow lands and successional forests across the landscape. While intensive agricultural systems are relatively fixed in space and time and tend to establish permanent non-forest spaces, extensive shifting cultivation regimes are spatially and temporally mobile, capturing intermittent resource abundance and allowing communities to easily shift these agricultural spaces in response to changing ecological and climatic conditions (see also Fox et al. 2013) and arguably support more complex and varied functional relations to local communities due to their relatively higher degree of agrobiodiversity and species variance between cropped and non-cropped phases (Xu et al. 2006). Furthermore, as shifting cultivation represents a relatively minimal opportunity cost (versus permanent paddies or plantations), it has facilitated community migration away from other threats such as political instability and armed conflict (such as during the Indochinese Wars during the middle- and latter-20th Century) or movements in reaction to displacement events such as the agricultural concession of village lands for rubber plantations (such as in the case of Atouk village, above).

Shifting cultivation within the otherwise largely forested landscapes of Xe Sap may also enhance biodiversity values. The logic underlying the supposed positive relationship between forest carbon enhancement and biodiversity is certainly a simplification. While the conservation or enhancement of mature forest under conditions of low forest cover may have positive impacts for

biodiversity (by reducing disturbances and enhancing forested habitat and vertical structure), large, mature forest stands themselves are not uniformly beneficial for all. Forest-loving and canopy species may benefit from increases in large areas of contiguous forest cover, but edge-loving species tend to exhibit a negative relationship to decreases in the edge-area ratio of forest stands (Fahrig 2003; Turner 2005). Despite pressures from road expansion, hydropower, mining and agriculture, Xe Sap NPA retains a high degree of forest cover across a large landscape. By creating breaks in forest cover and a mosaic of differential successional stages and habitat patches, shifting cultivation at the landscape scale increases structural heterogeneity and habitat diversity (Finegan and Nasi 2004). The diversity of species assemblages within these heterogeneous shifting cultivation mosaics have been shown in many cases to be higher than under conditions of contiguous mature forest cover (Xu et al. 2009). Swidden systems incorporate a broad diversity of species and cultivars both within the cropping area as well as in fallows in order to provide for diverse dietary needs of shifting cultivators, to spread risk in the event of crop failure, and to distribute labour requirements (Hett et al. 2012; Schiller et al. 2006). Ethnobotanical surveys of similar upland swidden landscapes in the region found an average of 60 -70 domesticated and semi-domesticated species in upland rice fields and a further 25 species which had been incorporated into adjacent fallow lands (Rerkasem et al. 2009), presenting a much higher degree of agrobiodiversity than intensive, sedentary agricultural alternatives. Similarly, wild species such as ungulates, wild pig, a number of edge-loving species of birds and the predators of these species that are endemic to the project area such as large cats, show a marked preference for heterogeneous landscapes (Acevedo et al. 2006; Shrestha 2004). The diffusion of agricultural fields such as that created within shifting agricultural mosaics have been shown to maintain populations of pollinators and other species through the boom-and-bust

masting cycles common to tropical Dipterocarp forests (Ickes 2001). Floral species assemblages may be similarly diverse. A biodiversity study in shifting cultivation areas found 418 plant species in fallows versus 319 species in nearby mature forest stands (Rerkasem and Rerkasem 1995), strongly suggesting that swidden landscapes compare favourably with mature forest stands for a number of biodiversity values. Given the foundational role that biodiversity (both wild and agricultural) plays in maintaining system resilience and the provision of ecosystem services, there is reason to question whether proposed REDD interventions to curtail shifting cultivation as a landscape-scale disturbance regime would in fact support, rather than undermine, the resilience of the social-ecological system.

Local versus structural drivers of forest change

Proposed REDD interventions in this context may intersect ambiguously with the local livelihood strategies that adapt to changing conditions through flexibility and mobility in space and time. While traditionally-practiced long-fallow shifting cultivation is not considered to be an important driver of deforestation in Laos due to its impermanence and its use of fallow areas and secondary forests rather than mature forest areas (Thomas et al. 2009), it was nevertheless identified as a key driver of unplanned forest carbon loss by the REDD Feasibility Study for which LUP (alongside improved legal enforcement of land use plans and NPA boundary demarcation) would serve as the appropriate corrective measure. Such selections (of driver and mitigation measures) are consistent with the constraints of how REDD is framed (or understood) at the project level, engaging with change-drivers resulting from local actions but not those that originate in the State's planning mechanisms. It is worth noting, however, that focusing on shifting cultivation versus other drivers of forest change has a long history in the contestation between state interests and local forest users. Since at least 1986, when timber revenues

comprised the principle source of income to the state treasury, shifting cultivation has been discursively framed as ‘backward’ and environmentally destructive by government authorities (Ireson and Ireson 1991). While there are few realistic alternatives to swidden in these areas (Alexander et al. 2010), authorities have nevertheless sought to eradicate it through legal bans, forced resettlement of villages engaged in shifting cultivation (Ducourtieux et al. 2005), increasing central state control over forested areas (Vandergeest 2003) and, most recently, through LUP wherein the amount of land allowed for upland agricultural production is limited to 3 hectares per family and fixed to specific parcels that are too small to enable long-fallow shifting cultivation (Fujita and Phanvilay 2004). By proposing LUP, the REDD project hopes to reduce carbon emissions and enhance carbon stocks by reducing the amount of forested areas impacted by shifting cultivation, and promote sedentarization and agricultural intensification. This may create a number of problems. The extensive use of communally held forested areas for shifting cultivation and the productivity of associated NTFPs in Xe Sap depend upon long-fallow periods. The long duration of the fallow period allows for the accumulation of nutrients in biomass for soil fertility, suppression of weeds, and enhancing the diversity and abundance of NTFPs and other species. Short fallow systems resulting from state-regulated LUP are, by contrast, typically depauperate of biodiversity (Foppes and Ketphanh 2000; Rerkasem et al. 2009), exacerbate negative impacts on soil and water resources through increased erosion (Mertz et al. 2009) and, where the fallow period falls below a minimum threshold, have been predicted to prompt the collapse of the agroecosystem more generally (Foley 2009). Further, declining rice yields under short-fallow systems have been shown to significantly increase supplementary hunting pressures, affecting local biodiversity (Robichaud et al. 2009) and fostering unsustainable extraction of NTFPs. Increased pest and weed pressures and declining soil fertility

under short-fallow and intensive agricultural systems require additional pesticide and other chemical inputs (Crissman et al. 2001), each with their own sets of environmental and social impacts which are particularly problematic within poor regulatory environments such as Laos.

On a structural-ecological level, the cessation of shifting cultivation within the largely forested landscapes of Xe Sap would be expected to lead not only to the simplification of livelihood systems but also habitat diversity and the rupture in key disturbance regimes, thus contributing to declining overall biodiversity (Cumming et al. 2006) and possibly paving the way for a regime shift in the social-ecological system (Scheffer et al. 2001). The simplification of these landscape mosaics and the segregation of 'social spaces' from 'nature spaces' through LUP in Xe Sap would further limit the diversity and spatial fluidity of complex functional interactions between social and ecological system components (see also Xu et al. 2006), reducing resilience (Carpenter and Brock 2004) and the spatial and temporal parameters conditioning social responses to climate change impacts (Folke et al. 2004). Where shifting agricultural areas are managed communally, and allow for inter-annual variation in the use of cropped lands per family, the privatization of lands through LUP and sedentarization may further restrict flexibility in the system (see for example Barney 2009).

The impacts of climate-related interventions are socially differentiated, wherein the poor may bear a disproportionate cost (Adger 2001; Alcorn and Royo 2007). The proposed project activities under REDD necessarily entail social impacts by disrupting traditional agricultural practices. While WWF has sought to compensate for these anticipated costs through the infusion of donor funding for livelihood activities, REDD's potential to achieve climate synergies beyond this initial period of supplemental funding is ultimately contingent upon its ability to compensate for these impacts rather than to externalize them. In theory, the proposed REDD project might

utilize revenues generated through the sale of carbon credits to compensate forest users at a rate equal to or greater than alternative land uses, but it remains an open question whether carbon revenue will (1) be sufficient to meet this criterion and (2) if it is, will in fact accrue to local forest users. There is no clear consensus on whether REDD needs to be specifically pro-poor, or merely not harm the poor (Arts and Buizer 2009) and thus be no more than a poverty reproducer (Evans et al. 2014). Recommended social safeguards suggest minimal standards for ensuring appropriate compensation, but these are weakly developed within the REDD framework in general—and under VCS in particular (Gilroy et al. 2014)—and are poorly regulated in practice. While the project may consider certification under the Climate, Community and Biodiversity (CCB) standards, giving greater weight to non-carbon values and adopting more robust social safeguards, it is doubtful there will be compensation for customary land-uses not recognized by formal tenure or that these additional provisions may be more than instrumental concerns, marginalized in the cost calculations of carbon market efficiency (Melo et al. 2014).

Nevertheless, robust social safeguards and the inclusion of biodiversity values within the REDD project, however enhanced, cannot by themselves address the larger structural issues which impinge upon the social-ecological systems in Xe Sap. Like many historic forest conservation interventions, the proposed REDD activities focus attention on the proximate drivers of forest loss stemming from the traditional livelihood strategies of poor communities without adequately addressing the macro-scalar dynamics of forest change and governance rooted in the broader political economy, including road expansion and the proliferation of concessions for commercial agriculture, mining and hydropower to promote foreign direct investment. This presents a deep problem for achieving local climate synergies through the REDD project, not only because it fails to address structural drivers of deforestation but also because it prompts state managers to

curtail local forest uses by providing direct financial incentives that are contingent on the degree to which the proposed interventions are achieved, potentially undermining local livelihoods and exacerbating tension between communities and the state, particularly where the benefits of carbon revenues may not reach the local level.

(Re)centralizing forest governance

Beyond what is described above, REDD may in this case present a particular structural obstacle to achieving climate synergies by prompting recentralization of forest governance. In the absence of external financial resources and incentives and given the remoteness of the NPA, active state administration of Xe Sap has been superficial at most, effectively devolving the governance of forest areas to local communities. In general, community (versus state) management of forests has been shown to achieve better protection (Persha et al. 2011), deliver greater co-benefits for local livelihoods (Chhatre and Agrawal 2009) and, by positioning local resource users as decision-makers, enhance resilience (Folke et al. 2002; Sandbrook et al. 2010). Forest governance reform movements in Laos in recent years have been moving toward institutionalizing decentralization (Chokkalingam and Phanvilay 2015). The REDD project risks redirecting resource flows away from local communities and toward government forest agencies and pushing governance in the wrong direction, slowing—or possibly reversing (Phelps et al. 2010)—decentralization of protected area management and undermining local adaptive governance by creating a monetary incentive for increased control over forest governance by central state authority (Larson 2011; Okereke and Dooley 2010).

CONCLUSION

REDD's potential to achieve synergies for climate adaptation in practice is attenuated by its tendency not to see (the complexities of) the forest for the (simplicity of its) trees. While it is well-recognized that forests are much more than carbon, operationally it is still assumed that other values—including those that undergird resilience to climate change—will be preserved or enhanced under REDD. This is doubtful. In some cases, REDD-as-practiced may reduce landscape heterogeneity and biodiversity by disrupting local disturbance regimes, undermine the resilience of local communities by simultaneously curtailing the diversity of available livelihood strategies and allowing structural drivers of change to remain unchallenged and, by incentivizing centralization, undermine adaptive governance. REDD would be better positioned to achieve synergies for climate adaptation if it were larger and yet lighter. A larger, less reductionistic and more informed REDD could engage constructively with multi-scalar and structural drivers of change across the socially-constructed adaptive landscape, while a lighter, more nuanced and experimental REDD may play a more effective and navigational—rather than prescriptive and technocratic—role in negotiating change along the social-ecological nexus supporting, rather than undermining, dynamic processes foundational to climate resilience.

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CHAPTER 4: NOT JUST ANOTHER VARIABLE: UNTANGLING THE SPATIALITIES OF POWER IN SOCIAL-ECOLOGICAL SYSTEMS

ABSTRACT

Increased attention has been paid to how the spatial dimensions of social-ecological structure and function play a role in the resilience of complex systems to change and disturbance. This paper moves this research further by exploring how diverse forms of power play a crucial but often overlooked role in shaping these spatial dimensions. Grounding these explorations in a National Protected Area in Lao PDR, this chapter explores how power relations become written onto social-ecological spaces through the contestation between (not only) local communities, international conservation organizations, protected area managers and state security agencies over particular environmental, social, and economic values. These contestations are rooted in and (de)legitimized by particular social-ecological discourses that emphasize, variously, biodiversity decline, national security, and global climate change and materialize in laws and management interventions, all with specifiable material outcomes across the social-ecological system. This research advances our understanding of the role of power in social-ecological systems and, in addition to providing a substantive basis for placing analyses of power central to social-ecological research, offers (at least) four important insights: (1) Local-level manifestations of power draw on supra-local discourses and networks, suggesting cross-scale interactions figure prominently in shaping the local outcomes in social-ecological systems. (2) However powerful institutions and actor-networks may be, power is never completely or simply

hegemonic as it operates across space, intersecting with and being reproduced and attenuated by other discourses and operations of power, including those of local people, though these all play out across a highly uneven sociopolitical terrain. (3) Programmatic interventions rooted in particular social-ecological discourses do not map onto blank spaces, rather they are shaped by antecedent (and, indeed, subsequent) spatializations of power, suggesting that social-ecological outcomes in practice do not flow directly from policy. (4) The (de)legitimizing discourses enjoy varying degrees of purchase amongst social actors, including those engaged in resilience-based analyses, suggesting that resilience practitioners and scientists play an agential role in negotiating the power-filled terrains of social-ecological systems.

INTRODUCTION

Conceptualizing social and ecological variables in complex systems as conjoined elements within a larger, social-ecological complex has been particularly productive in shaping the ways we understand dynamic processes within real-world systems. Further, by focusing attention on how these social-ecological systems negotiate change processes, self-organize following disturbance, and the ways in which key system elements are retained, lost, or modified, we have gained important insights into how to manage complex systems despite substantial uncertainty and unpredictability (Folke 2006, Nelson et al. 2007). Understanding complexity in real-world systems and applying this understanding to addressing real-world problems requires that abstract principles analyses be grounded in particular systems—systems that are necessarily bounded in space and time.

In so doing, we are reminded that social-ecological systems are geographic objects. This observation is not especially novel. It does, however, open up vast possibilities for exploring how key elements and processes of social-ecological systems are rooted in, and map out onto, space and time and the implications of these space-time dynamics for system processes. Recognizing the ineluctability of space-time in social-ecological systems, recent scholarship (for example Cumming et al. 2011) has begun to explore the concept of *spatial resilience*. Spatial resilience focuses on the role of spatial variation and temporal change within complex systems and may be defined as “the ways in which spatial variation—including such things as spatial location, context, connectivity and dispersal—influences (or is influenced by) the resilience of a social-ecological system” (Cumming, 2011: 3). Internal elements include the spatial arrangement of system components; the spatial variation in internal phases (e.g. succession); and the size, shape, number, and character of boundaries. External elements of interest to spatial resilience, by contrast, include context, connectivity with exogenous systems and processes, spatially-driven feedbacks and subsidies.

For both social and ecological elements, their distribution in space and time and the parameters that govern their interactions are shaped in large part by social and institutional structures and processes, adding a whole new dimension of complexity relating to questions of legitimacy, solidarity, exclusion and access, amongst others. Given the dominance of human influence in almost all real-world systems, interrogating these social dimensions must be a central concern in seeking to understand social-ecological systems (Bolliger et al. 2005, Barrett and Constanas 2013). Importantly—and as I will seek here to demonstrate—these social processes that shape social-ecological systems play out across an unequal field of power wherein the resource available for shaping social-ecological outcomes are distributed differentially (Escobar 1998; Watts 2009;

Ingalls and Stedman 2016). Both because power dynamics play out in spatially-situated social networks and because the implications of these interactions shape the distribution of resources and risks across space and time (Adger 2001; Poulsen et al. 2003) their operation in social-ecological systems may be interrogated with reference to their spatial and temporal dimensions. This paper focuses attention specifically on how power is active in shaping the space-time dimensions of governance arrangements and institutional processes and, in turn, how these power-filled arrangements shape the resilience of social-ecological systems across space and time. This kind of analysis, I suggest, may be much more than a project of introducing yet another variable into the already-complex admixture of elements in the social-ecological system. Rather, it seeks to render explicit dynamics underlying the broader fabric of real-world social-ecological systems and, in doing so, to potentially turn common insights and prescriptions on their heads (Massey 1999).

Perhaps most obvious is power understood as dominance, located primarily in the apparatuses of the state or social actors bearing its delegated authority, and in which force, violence and coercion are strongly implied. Such conceptualizations are limited in application to understanding social processes within social-ecological systems by *a priori* concern with the formal apparatus of society. Including these formal apparatuses—but also elaborating on and departing from them—I am invoking a particular, Foucaultian view in the context of this paper that emphasizes the multiplicity of power within and across society, as something overlapping, fluid and negotiated (Foucault 1984). Foucault's (2000) concept of governmentality provides an important theoretical construct for engaging with the functions of power in social-ecological systems, useful for this discussion. Within governmentality, power is understood not primarily as dyadic (person-to-person), quantitative or an object of possession. Rather, it is understood to be

diffuse, functioning throughout society to shape actions (Foucault, 1982) and thus while it may crystallize in the apparatus of the state (Agnew 1999), or powerful commercial or military institutions, it is always shared, relational and differentiated, and thus never hegemonic (Huxley 2007). “The exercise of power” writes Foucault (1982: 792), “is not a naked fact, nor is it a structure which holds out or is smashed: It is elaborated, transformed, organized; it endows itself with processes which are more or less adjusted to the situation.” This view of power, I suggest, useful allows us to move beyond an analysis of state institutions and legal codification to interrogate their subtext and so better to understand the full scope of their influence. It also allows us to focus attention not only on how power may be destructive and exclusionary, but also how it is generative, creative and productive.

The exercise of power is necessarily spatial and temporal, and thus a geographic concern. The rationalities of government—its organizing logics, calculations and articulations of what it understands to be the most appropriate roles and responsibilities of the state and society (Elden 2007)—are always inextricable from the governance of territory and the distribution of people, resources and the spatially-situated rules governing these. These rationalities of government materialize within particular technologies—specific instruments of law, markets, social norms and other devices employed in the project of bringing about obedience in and of society. While the state may represent the coalescence of power, with the territorial state its primary space of operation, this power is also mediated and transformed not only by non-state powers, but also by the fragmentary, divergent and often contradictory forces within the state itself. This opens up the very useful observation that it is not power, in the singular, which maps out across space, but rather the multiplicity of powers that overlap one another, competing, reinforcing, merging with and fracturing one another in the continual interplay of power in social-ecological space-time.

These powers interact in space and through time to shape spatial meanings through such things as boundary (re)formation, projects of place-making, and the extraction or preservation of socially-constructed environmental values. Power expresses itself in space and through time by the various geographic imaginings of the powerful, and the counter-imaginings of subaltern peoples, and the (de)legitimizing discourses—in policy, in media, in the coffee-shop parliaments of common society—that infuse these contestations. Discourses are employed by the powerful to delegitimize the space-claims of the less-powerful, to simplify the complexities of subaltern ways of being and so to render them legible to the instruments of government and susceptible to their intervention (Basset and Zueli 2003). But the less-powerful, the objects of these simplifying discourses, are not passive. They are themselves active agents in the (re)production of power, sometimes participant in these discourses and technologies of power, sometimes non-participant, sometimes in open revolt.

Because of all this, power maps out onto space unevenly. As it transmits across a social-ecological terrain some elements strengthen while others weaken as they interact with the antecedent power-claims of social actors in space, and also the dynamics of power between local spaces and those non-local—global, regional, national—forces that impinge upon local social-ecological systems. Social-ecological systems are thus the product not only of local elements and processes, but also multi-scalar power asymmetries.

In published scholarship, analyses of how power operates within and across the space-time of social-ecological systems to shape their resilience in the face of change are as scarce as they are urgent. Understanding how dynamics of system change are attenuated and directed by power processes is a necessary step in addressing the urgent threats (and, indeed, opportunities) posed

by global environmental change—a macro-structural set of events that will itself render complex systems more opaque, unpredictable, and perplexing (Turner 2010).

But as I noted earlier, these abstractions are best concretized in the complexities of real-world systems. This chapter therefore presents an interrogation of spatially-explicit power relations within a largely forested social-ecological system, in and around Xe Pian National Protected Area along the Lao-Cambodian border in former French Indochina (figure 3, exploring some of the ways in which the overlapping spatialities of power within this system have been produced and, in their operation, function to shape the resilience of the system to change.

RESEARCH SETTING AND METHODS

Xe Pian National Protected Area (Xe Pian NPA) was established by decree of the Prime Minister of Laos in October 1993. Comprising of approximately 2,400 km² of dense evergreen, dry Dipterocarp and mixed-deciduous forest types, Xe Pian NPA has been an historically-significant habitat for numerous globally-significant populations of birds and mammals. Biodiversity surveys carried out in 1993 found more than 350 species of birds, including at least eight globally threatened bird species such as the Giant Ibis, the white-shouldered ibis, green peafowl, woolly-necked storks and nesting populations of Saurus Crane (Duckworth et al. 1993). In addition to historic populations of Asian elephant, large cats (*Panthera*), dhole *Cuon alpinus*, Asiatic black bear and sun bear (Scotson 2012), banteng *Bos javanicus* (Steinmetz 2004), and Irrawady River Dolphins (Baird 1997), it was also considered to harbor the largest known population of gibbon *Nomascus spp.* and *Hylobates spp.* in the world (Timmins et al. 1993, Duckworth et al. 1995).

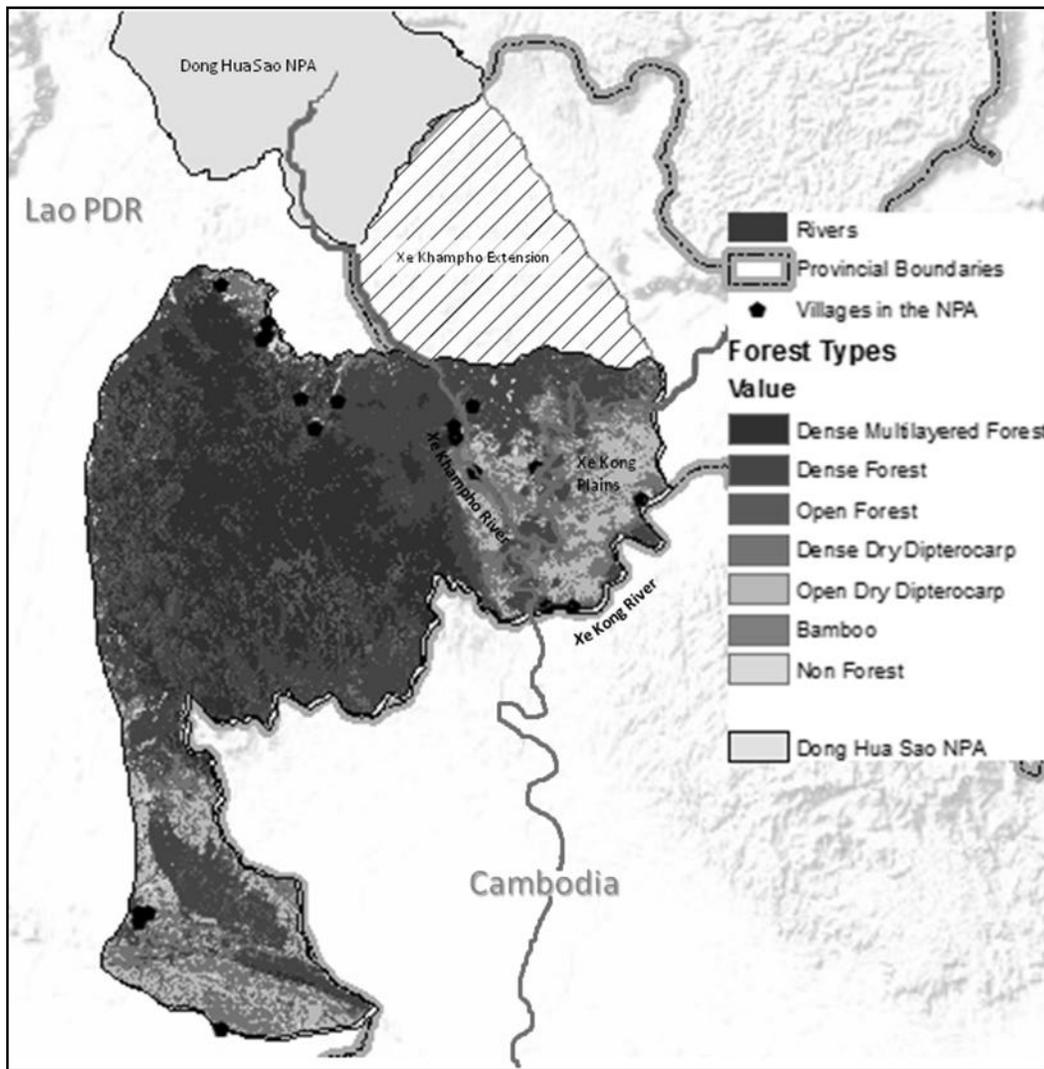


Figure 3: Xe Pian NPA

Xe Pian NPA is also a space inhabited by local human communities, distributed across 14 permanent villages within the NPA itself but utilized by more than 10,000 individuals outside the NPA. Exhibiting a high degree of natural resource dependency that varies by community, some villagers purchase as little as 3% of their consumable resources. Local communities utilize a wide diversity of species for food, fibers, medicines and marketed products. Baird (1997), for example, estimated that some communities derived 40-90% of their protein from local aquatic resources. Ingalls and Luangsackda (2009) identified more than 250 species of plants and

animals used by local communities along the northern extremity of the NPA, a finding similar to those of Elkington et al. (2014). Malva Nut *Scaphium macropodium*, berberine vine *Coscinium usitatum*, resins from Dipterocarp species, and semi-domestic varieties of cardamom *Amomum villosum* are all commercially-significant species that play a significant role in overall household income, particularly for poorer families.

Alongside a high-degree of resource dependency lays persistent poverty. According to household surveys carried out in 2012, 75% of households reported food insufficiency (reported as rice shortage) ranging from 3 to 10 months of the year (WWF 2013). Food insecurity relates to a low degree of land holding amongst local communities, with holdings ranging from landlessness to 4 hectares, but with the majority cultivating less than 1 hectare. Due to the high degree of endemic poverty and food insecurity, as well as forecasts of increased flooding and heat stress under changing climate conditions (Meynell et al. 2014), Xe Pian lies within an area considered to be a high-risk area of priority for Lao PDR, a country more generally considered to be highly vulnerable to climate risks (GFDRR 2011). These climate vulnerabilities, together with intractable issues of poverty and reports of rapid and severe decline in species diversity and abundance (e.g., Steinmetz 2004, Scotson 2012), presage a number of problems for social-ecological system functioning into the future.

To address these impending social and environmental drivers, a number of programs have been established within and around Xe Pian NPA. Since its inception in 1993, Xe Pian has attracted multiple and somewhat overlapping conservation projects, including the Lao-Swedish Forestry Cooperation Program (LSFCP), a number of projects under WWF, the Global Association for People and Environment (GAPE), the Asian Development Bank-funded Biodiversity Corridors Initiative (BCI) and, most recently, a REDD+ Project supported by WWF-Austria. It is these

programs and the discourses surrounding them that form the core object of my analysis here. The research approach thus employed included analysis of project documentation (project reports, management plans, etc.), interviews with government officials at national, provincial and district levels (n=24), international and national experts associated with them and related political and programmatic processes (n=13), and the communities in the NPA and surrounding it who participated in these projects and the wider social processes¹⁶. Engagement with local communities primarily took the form of focal group discussion (n=22 groups in 9 villages) involving 272 of individuals between 2012 and 2015, supplemented by local key person interviews (n=16). Focal group engagements involved semi-structured discussions, participatory resource mapping, and community-led field surveys¹⁷. Wherever possible, interviews and focal group discussions were audio-recorded in Lao language using a handheld recording device and later transcribed by me. Data analysis involved review and selective coding of transcripts and hand-written notes, concept-mapping and identification of key elements and processes reported by participants¹⁸. In order to situate these local analysis within broader institutional processes and to analyze relevant policy discourses, I also participated in 17 national dialogues and working groups in Lao PDR.¹⁹

In the sections that follow I will trace the evolving spatial dynamics of space and power within this social-ecological system in a loosely-chronological fashion, asking: (1) What relations of power manifest within the spaces of the social-ecological system—surrounding what objects and

¹⁶ Participants were purposefully selected to include those individuals who had particular knowledge of processes and events in Xe Pian, and to encompass a diversity of viewpoints. Detailed selection criteria and process are discussed on pages 149-152 (national and ministerial level, incl. table 3) and 164-165 (sub-national level, incl. table 6) in Annex 1.

¹⁷ Detailed methods for these focal group discussions are included on pages 152-172 of Annex 1, sample discussion guides are included as Table 4 (pages 152-158), Table 8 (pages 168-170) and Table 9 (page 171-172).

¹⁸ Detailed analytic methods are discussed on pages 172-174 of Annex 1.

¹⁹ These national level participant-observation activities are discussed in some detail on pages 158-159 in Annex 1.

between what interests—and how do they interact with one another? (2) What discourses are employed to (de)legitimize these spatializations of power? and (3) with what implications for the social-ecological system?

FORTRESS CONSERVATION AND THE ORIGINS OF THE NPA

In the late 1980s and early 1990s, when timber exports become an increasingly important source of foreign exchange in Laos and the principle source of revenue for the state treasury (Ireson and Ireson 1991), Laos initiated two closely-related policy approaches aimed at limiting environmental degradation and ensuring a sustainable forest resource base. The first of these was a decision to participate in the multilateral Tropical Forest Action Plan, a plan aimed at professionalizing the forest industry by clarifying and bolstering rules of (largely state-based) forest governance, and limiting unauthorized and inefficient use of forest resources (Guttal 2011). The second measure, that which would result in the creation of Xe Pian NPA, was a broad-based exploratory assessment for a system of national nature reserves throughout the country, beginning in 1988 with support from IUCN and the LSFCEP. This latter program entailed not only the assumption that state intervention through nature reserves was the best approach to regulating the diverse threats impinging on Laos' natural environment, but also particular criteria regarding what sorts of areas would serve as the appropriate objects of this intervention. According to Berkmüller and others (1995) early assessment for the establishment of a national network of nature reserves took as one of its key starting points a pre-existing network of largely unmanaged forest reserves created under the administration of the Kingdom of Laos²⁰, and newly

²⁰ Interesting to note that the foreign technical advisors were largely unaware of any pre-existing forest reserve areas, but accepted a list of proposed areas—many of which had already been designated as reserves under the royalist regime (FAO/UNEP 1981 as cited in MacKinnon and Ramsay 1997, personal communication with Richard Salter May 2015).

proposed areas that met specific criteria including the presence of key species, large undisturbed tracts of forest with 75% of original forest cover (covering a minimum of 500 km²), degree of threat (though unspecified) in order to create a national reserve system comprising of representative proportions of forest types from the biogeographic region of the indo-malayan realm as presented in MacKinnon and MacKinnon (1986).

These national assessments recommended a total of 68 forested areas for inclusion in the national reserve system (Salter and Phanthavong 1989), including two areas—Xe Pian and Dong Kalo—which would later be amalgamated into the Xe Pian forest reserve in 1993. While most areas considered for inclusion in the reserve system were assessed through secondary data only, a particularly intensive on-the-ground survey effort was carried out between 1992 and 1993 for Xe Pian and Dong Kalo, due to their high conservation values. These surveys and other reports cited above (and discussed further below) reflect particular sets of assumptions regarding nature and the relationship between it and human society in general and communities within Xe Pian in particular. Drawing a sharp distinction between social and ecological elements, the environmental discourses that proved formative in the creation of Xe Pian legitimized a fortress-like approach to conservation, defining ‘nature spaces’ in very particular ways (see also Baird 2009). This ‘fortress conservation’ model of environmental governance (see Davis 2007) carries with it (at least) three important assumptions: Nature is something quite distinct from human society, is immediately threatened by encroachment, and urgent legal and administrative action is needed to protect it from local (and non-local) people. Measures to protect nature were here explicitly spatial, (re)defining and separating the spaces of nature from the spaces of (categorically degrading) human livelihoods.

Surveys assessed not only biodiversity and other environmental values but also threats to these. Local livelihood activities, especially hunting, fishing and subsistence agriculture, were typically described as ‘encroachment’ and ‘degradation’ and, alongside commercial logging, were identified as the primary environmental risks (see for example Timmins et al. 1993). Duckworth and others (1993) who carried out some of these surveys, recommended that human uses be controlled in the northern, more populated areas of Xe Pian, but that local people be excluded entirely from the main block in the central portion of the reserve, while all clearance of vegetation around wetlands be stopped entirely, regardless of location. Timmins et al. (1993:6) concluded that Xe Pian is “relatively pristine” but “will be irrecoverably degraded without immediate measures to curb human use.”

These surveys served as the technical basis for the establishment of the national forest reserve system by Prime Minister Decree 164 in 1993. Article 4 of the Decree included specific provision for the regulation of human uses inside the forest reserves, including prohibition of the holding of lands, the erection of houses, or the expansion of agricultural fields, allowance for the collection of NTFPs only by state permission, an absolute prohibition on ‘slash and burn agriculture’ and the removal of any trees, with the exception of sampling for approved scientific purposes.

ECOLOGICAL MODERNIZATION, EXCEPTIONALISM AND NEGOTIATION

These early developments in the creation of what would come to be called, variously, Xe Pian National Biodiversity Conservation Area (NBCA) or Xe Pian NPA, exemplify particular, and at least partially non-local views of nature and the relationship between humanity and other species. From the development of the reserve network itself—shaped by foreign biodiversity specialists

and drawing on global, spatialized biogeographic classifications of forests types—to the threat assessments that focused attention on local subsistence uses and characterized these in particular ways exemplifying not only the fortress conservation mode of governance but also a more generalized approach to ecology often referred to as ecological modernization. Ecological modernization refers to the regulation of nature through an emphasis on control, efficiency, technological innovation, (Western) scientific categorization, zoning, and mapping, through which state agencies and forestry administrations (Hajer 1997) are seen as the self-evident modality through which to ensure the maintenance of particular environmental values which are, themselves, taken to be self-evident and therefore uncontestable (Fletcher 2010). That traditional local uses of ecological elements were defined as ‘threats’ and ‘degradations’ and their rectification achieved through the creation of state-managed reserves under the guidance of foreign technical experts and an increasingly professionalized national forestry administration is particularly indicative.

This mode of intervention in Xe Pian began to find yet fuller expression in the years that followed the 1993 Decree. Because regularizing and modernizing nature entails the simplification of social-ecological space and, especially, the differentiation of social space from ecological space (Escobar 1999) conservation has commonly entailed displacement effects (Agrawal and Redford 2009) whether through displacement of peoples outside of protected areas or, perhaps more applicable here, *in situ* displacement where the spaces of local communities are redefined and certain resources are excluded. For example, the Land and Forest Allocation (LFA) program, enacted throughout the protected area and the surrounding area toward the end of the 1990s was one of the key mechanisms employed to formalize these spatial differentiations, with the stated goal of reducing agricultural expansion and eradicating shifting cultivation. LFA

involved the identification and mapping of traditional village areas according to specified (and predefined) use zones, with such designations as ‘residential areas’, ‘conservation forest’, ‘use forests’, agricultural land’, etc. These maps would then serve as social documents recognizing (some) local customary place-claims but also as regulatory instruments to sanction (and, by implication, censure) various forms of resource use. In an effort to secure some environmental values, LFA (re)defined the meanings of particular spaces with normative (and legal) implications for local resource governance. While this intervention was justified on the grounds that zonation and mapping of social-ecological systems was a necessary precondition for sustainable resource management and enhanced tenure security (Fujita and Phanvilay 2004), its application in practice also suggests several adverse outcomes. Whatever its intention, LFA has been widely criticized in Xe Pian with regard to its technical and procedural insufficiencies (GoL 2000), and more generally for exacerbating resource scarcity and food insecurity, accelerating soil degradation by artificially and unsustainably intensifying agricultural activities (Lestrelin et al. 2005) undermining conservation objectives (Ducourtieux et al. 2005) and as a willful attempt to reterritorialize large tracts of land and place these under the control of the state and render them available for economic concessions (Vandergeest 2003, Barney 2009). Resilience thinking also suggests that precisely fixing these agroecological zones at a particular point in time may reduce resilience and spatial mobility, hardening system boundaries through policy.

These early beginnings in Xe Pian initiated a more sustained political and programmatic trajectory built upon ecological modernist and fortress conservation commitments. With support from the Global Environment Facility (GEF), the Government of Laos developed a Management Plan for the NPA in 2000. Under the Management Plan, regulations, mapping and zoning of Xe Pian became more detailed, with a continued emphasis on mitigating local threats to biodiversity

values through regulation, patrolling and law enforcement instituted originally under PM 164. While the Management Plan affirms the importance of participatory approaches to ensure effective governance within Xe Pian, local involvement in the development of the Management Plan itself was very limited: evinced, for example, in that local people were not involved in its development. The non-participation of local residents was, according to planners, unavoidable because of their ignorance, explaining (GoL 2000:5) “the majority of communities living in and around Xe Pian NBCA do not have sufficient understanding... to participate meaningfully in preparing a management plan.”

It was not only the ignorance of local communities and the destructiveness of their livelihood strategies, however, but also their sheer numbers that were of concern. WWF (1997:87) recommending the promotion of contraception and birth spacing, concluding that “unless the human population in and around XP [Xe Pian] is curbed, trying to save or protect threatened animal species in XP may be futile.” The Management Plan similarly reflected this concern, identifying population growth as a key risk and affirming the right of the state to restrict population growth and instituting a blanket proscription on the migration of any households into the NPA.

While proposed interventions in the Management Plan otherwise largely reflected previous prescriptions provided under PM 164 and the recommendations of technical advisors during Xe Pian’s formulation (e.g., Duckworth et al. 1993, Timmins et al. 1993, WWF 1997), the Management Plan implies a very important innovation: a turn toward an environmental-exceptional mode of governance, an explicit circumvention of normal legal processes in an effort to stem biodiversity decline and environmental degradation. This exceptional mode of governance is perhaps most clearly manifested in the approach taken to two issues: the level of

regulatory control of the protected area itself, and provisions made for the territorial expansion of its command area. In the first case, the Management Plan specifies that Xe Pian should be classified as an IUCN Category II National Park, allowing tourism, research and spiritual and cultural values, but precluding even indigenous livelihood activities where they conflict with super-ordinate conservation goals. The Management Plan further stipulates that until Xe Pian is legally designated as a Category II National Park “it should be managed as if it had such a designation” (Volume 2: page 61), including through the use of law enforcement agencies, as set out in the general provisions of the Management Plan.

In the second case, that of the inclusion of areas not specified in PM 164, we see a similar approach. The Management Plan interpreted PM 164 to require Prime Ministerial approval for the retraction of NPA boundaries, it allowed for their expansion—thus the enclosure of more space under a particular mode of environmental governance—at the discretion of forestry authorities who would manage these incorporated spaces “as if they were part of the NPA until such a time as was legally recognized” (page 20). The most ambitious attempt at this extra-judiciary enclosure involved the proposal to include the so-called Xe Khampho Extension area, connecting Xe Pian to Dong Hua Sao NPA in the north (Figure 1). During the early stages of the forest reserve system, this area was of particular interest to conservation advocates as a connectivity corridor between the two NPAs. While this area was intentionally excluded from the reserve system by Provincial authorities (Dwyer et al. 2015), the area was nevertheless included within the management area of Xe Pian within the Management Plan, with a provision that this area should be managed as if it had already been incorporated into the NPA until such a time as this could be legally established. The implications of these legal exceptions are significant. While promoting the rule of law and a state-centric narrative of biodiversity

conservation, these provisions legitimized special, extra-judicial measures to secure biodiversity values through the discretionary enclosure of lands by forestry agencies in a manner that circumvented normal legal processes and associated social-safeguards built into normal legislative process.

The 2000 Management Plan, like PM 164 before it, reflects a fortress conservation approach to conservation, and each (and, especially, subsequent NPA managers) had to deal with the practical reality of implementing these policies against the antecedent territorial claims of resident communities. Among government officials participating in this research, there was a marked ambivalence about the rights of communities within these forested areas. One forestry official (Champasak Province, June 2015) reminded me: “It is not like in your country. We already had people living in these forests, we could not just move them out. In the beginning, we considered it, but it would be very expensive and we couldn’t afford to move them.” A senior official at the Ministry of Natural Resources and Environment (MONRE) had reflected similarly on the difficulty of spatially differentiating these place claims (October 2014): “We need to decide the limits of the areas of the villages inside the NPAs. Where does the village area end and the government’s area begin? Where are they forbidden to clear, or do they need to be resettled outside the NPA altogether?” Implementation on the ground suggested a degree of give-and-take. An elder in one village inside Xe Pian (June 2015) recalled: “When they first came to announce the establishment of Xe Pian, we really argued with them. We said ‘we have been more than one hundred years, we have lands here, we have rice paddies! How will we live?’ It was like the *fon la vong* [a traditional Lao dance], we went round and round with them. In the end, they said we could keep the fields we already had, but we could not open new fields.” The Management Plan formalized these spatial negotiations, allowing that resident communities had

the right to provide for a “basic standard of living”, but “individuals and families who aspire to more than this will be encouraged to leave the protected area and seek opportunities to realize their ambitions elsewhere” (Vol. 1:11). Poulsen and Luanglath (2005) record at least one incident where this regulation had to be enforced in a case where a young household had created new agricultural land and were subsequently disciplined by the village and made to find land outside of the NPA.

This concern with the possibility that local communities might expand their agricultural areas due to population growth or a desire to increase their standard of living has intersected problematically with social development goals, for while local communities have been allowed to retain approved, pre-existent land holdings, specific provision has been made to disallow the issuance of land titles to communities within the NPA, or the use of their lands as collateral for securing development loans (GoL 1993, Article 4). An official at the Ministry of Natural Resources and Environment (February 2015) reflected on this difficulty, not only because more secure ownership in the form of land titles might compete with conservation goals, but also that it might conflict with state interests: “We have to consider the livelihood needs of communities, but also to consider when and how to take away the land when it is appropriate, and transfer it to state uses, and the best way to go about this. After all, of course, all land belongs to the state.”

While PM 164 (GoL 1993) had established Xe Pian and specified its area and boundaries on paper, the process of physically demarcating the NPA took several years and still remains a point of contention. While biodiversity assessments were carried out in the field, the boundaries of the NPA itself were imagined largely from resource managers at the central government level. One official involved in the designation of the NPA system reflected: “The NPA boundaries were just created on a map, no one really went to the ground level. Someone sat in an office and went

[draws a circle in the air] with a marker.” WWF’s (1997) assessment suggests that rigorous and clear boundary demarcation, and enforcement of this boundary, would support not only the interest of state forest managers but also local interests which, it assumed, would be facilitated by enhanced resource control through the exclusion of outsiders, a win-win for conservation interests and local exclusionary place-claims. In practice, however, the actual physical demarcation of the boundary proceeded irregularly and varied considerably with regard to the degree of local participation. The forestry official responsible for this announcement reflected: “I remember the day Xe Pian was announced. We drove around to all the villages and informed them the forest was now a reserve. Some of the villagers, they were not happy about it. They were afraid the government was going to take their land. We reasoned with them and, in the end, they agreed. We just used the Road 18b as the boundary since this was easiest” (Champasak Province, June 2015).

The Management Plan (Gol 2000) reflects on this shortcoming, pointing out that in many areas the boundary was demarcated without local consultation. An elder in a village (April 2013) along the northern extremity of the NPA recalled: “One day a truck came, and they just put the [boundary] stone down. They didn’t even talk to us. They say now that the boundary is right there, but this is all our land. Their land is way over there, more than a kilometer away.” While it was originally envisioned that place-claims between forest managers and local communities could be shared and differentiated through overlapping sets of powers and responsibilities within areas traditionally under village management, the boundary of Xe Pian has come to be viewed as a symbolic as well as statutory differentiation of space and ownership. In one village whose traditional boundaries extend well into the NPA, a local elder was unequivocal, reflecting a

perspective very common amongst participants across all villages: “This area belongs to the village but there, beyond their boundary, all belongs to government and not to us” (June 2015).

While boundary demarcation, zoning and other spatial classifications form an often unquestioned technology in the management of environmental resources, these spatializations are more than technical processes, they are moral and political acts (Stokowski 2002) that reflect and reproduce power relations (Walker and Peters 2001) within social-ecological spaces by embodying particular environmental narratives. The various spatial processes in Xe Pian differentiate ‘state’ versus ‘local’ space claims and redefined local spaces and establish legal norms for what kinds of uses—and thus what kinds of social-ecological outcomes—were (dis)allowed in each. These spatializations were, however, socially differentiated both in the processes through which they were produced, as well as in the subsequent meanings of those spaces and of the boundaries that enclose them. Boundaries, we are reminded, are not objects so much as expressions of social relationships, carrying socially differentiated meanings that vary by actor (Ribot and Peluso 2003), allowing some forms of access to some resources for certain people while excluding other people and/or other uses. This dynamic of differential access, ownership and meaning—and the ecological implications of these variations—are most clearly exemplified by the issue of timber extraction and trade in the NPA, a subject which will occupy much of the rest of the paper.

From the very beginning, commercial logging has been carried out in Xe Pian, despite an explicit ban on the extraction of timber from NPAs apart from research purposes (GoL 1993:Article 4). Biodiversity and habitat surveys by Duckworth and others (1993), Timmins and others (1993) and Bezuijen and others (2007) all noted log landings and trails, primarily concentrated within the south-central and southern portions of the NPA and along the Cambodian border, such as at the security checkpoint at the confluence of the Xe Pian and Xe Khampho rivers. An important,

early exception to this was the concession of 5,000 m³ of timber from the northern portions of the NPA inside the village territory of Ban Kiat Ngong in 1999. While the concession was granted to a state-private joint-venture company for the clearance of wind-fallen timber, a World Bank investigator reported that timber was taken from an area of approximately 8-9 km² within the NPA, with 83.5% of timber being taken from standing trees (Claridge 2000).

These logging events, while substantial and apparently in direct conflict with the provisions of PM 164 and the conservation objectives that formed the basis of restricting local access to resources in Xe Pian, were a foreshadow of the pace and scale of logging set to transpire in the years following 2010, the subject of the next section.

MILITARIZATION, ROSEWOOD AND THE BORDER

The spatializations of power and how these shape the social dynamics of resource governance and access, take on a special character along international borders as the discourses surrounding contested claims and spatial controls encounters discourses of state security (Dwyer et al. 2015). Xe Pian's proximity to the Cambodian border has played an important role in its history, with immediately relevant implications for its governance in contemporary times. During the decades of protracted conflict throughout the middle part of the 20th Century, the forests of what would come to be called Xe Pian were a refuge for dissidents and Communist revolutionary fighters, distant from both Royalist and colonial military forces and protected by the forest canopy from aerial observation. It was estimated that during the 1960s and 70s large numbers of Lao and Vietnamese allies lived for as long as a decade in the forests (WWF 1997). A local villager and former insurgent, now living on the outskirts of the NPA recalls: "During the war, we lived for a long time in the forest. The regular people could stay in the village, but we, the young men who

fought for liberation, could not stay. We had to live in the forest, maybe 10 kms away [he points south].” Villages further inside the NPA played a pivotal role in hosting the insurgents. Ta Ong village, and ethnic Brao community, was proud, “we were a revolutionary village. Fighters came from two provinces to stay in our village.” More than a decade later, after Laos had achieved its independence, Xe Pian again became the refuge of political refugees and military insurgents, as the Khmer Rouge lost power in Cambodia and dissident fighters fled across the border. For local communities, these were times in which the forests were insecure. “Many years ago,” according to one village elder (June 2015), “the black shirts [Khmer Rouge] came into the forest, but mostly over toward Attapeu. We were afraid to go into the forest.” One conservation practitioner who grew up in Xe Pian recalls his childhood during those years: “When I was young, sometimes they would come to village and tell us ‘there are terrorists in the forest near the village’ and then we would not go. I think the adults also were afraid, they were afraid that if someone saw them going into the forest the government would think they were collaborators with the black shirts” (February 2015).

Insecurities related to the intrusion of Khmer Rouge fighters and more general concerns relating to national sovereignty and the control of the international border have resulted in a large military presence in Xe Pian. While the primary strategic focus of the military has been on the areas immediately adjacent to the international border, the spaces controlled by military forces have been highly fluid in space and time in response to insurgency events and, perhaps as often, opportunities for the extraction of timber. The 1992-3 biodiversity surveys, for example, while persistently excluded from military controlled areas near Ban Xot and the Xe Kong Plains (Timmins et al. 1993), were also interrupted by *ad hoc* military exclusions and the eviction of the survey teams on reports of ‘terrorists’ in the Dong Kalo area of Xe Pian. These temporary

exclusions of foreign advisors and technical experts, however, were also used in cases apparently unrelated to security, as in the case of Claridge (2000) who was excluded from logging areas during his World Bank-commissioned field inspection. These exclusions, whatever their intention, functioned also to limit foreign observations in large parts of Xe Pian.

While the militarization of space in Xe Pian interrupted scientific surveys and the access of regulators—in this sense apparently at odds with the goals of ecological modernization—it also came to serve the interests of conservationists with regard to the practical implementation of environmental regulation. For example, under the conviction that subsistence hunting and, increasingly, poaching of marketable species was a key local driver in biodiversity decline the Management Plan instituted a ban on all firearms in the NPA, “except for by government officials in performance of their duties” (volume 1, page 49), with the police carrying out operations to confiscate guns throughout villages in the NPA on at least two occasions during the following 4 years (Poulsen and Luanglath 2005). Disarming the local population in the interests of securing biodiversity values—all legitimized by particular narratives that framed local communities, and not military agencies, as threat—was synchronous with the expansion of the role for military and police units which began to play a more active role in patrolling and law enforcement within the NPA.

While logging in Xe Pian had been a persistent problem since before its inception, the pace and scale of logging operations and the contestation surrounding these operations began to come to a crisis around 2010 as the global market for rare tropical rosewoods, especially *Dalbergia cochinchinensis*, exploded (EIA 2014). Chinese demand for this rosewood—valued upwards of US\$50,000 per m³—incentivized an unprecedented expansion of trade networks across Southeast Asia but especially within forested areas along international borders—such as Xe

Pian—where many of the last stocks of rosewood remained (Singh 2013). According to local communities, this led both to the issuance of logging permits to at least two companies in Xe Pian by 2012 who, in the one case informed villagers that they had been authorized to cut timber for the construction of houses for ‘senior government officials’ and, in the case of the other, to recover rosewood that had been illegally logged by Cambodians (village elders, May 2013). The military was similarly active, invoking state security privilege to prompt the issuance of a Prime Ministerial Decree in 2010 conferring control of forested border areas to the military and, under this authorization, a specific concession to the provincial military units in Champasak to clear border areas within Xe Pian for the purpose of establishing a road connecting Route 13 to the confluence of the Xe Pian and Xe Khampho Rivers. These legal provisions—albeit exceptions by executive decree—provided a veneer of legitimacy to a much more ambitious program of military expansion throughout Xe Pian. By 2013, military logging encampments were reported in several areas throughout Xe Pian (local interviews, April 2013).

These efforts to enclose and control the social-ecological spaces of Xe Pian, however aggressive or legitimized, were not overtly hegemonic. It was not only state-sanctioned companies and the military that were mobilized to take advantage of the lucrative rosewood market. Local villagers became increasingly involved, sometimes as guides for companies but often on their own initiative. One elder in a northern village explained: “We protected this forest for years. When they announced the opening of the protected area, they told us it was our national duty to protect the forest. Now, they are all cutting—the big people, the military—if they are going to cut, why shouldn’t we cut, too?” (February 2012). For some villagers, logging of timber in the protected areas was a practical necessity in the face of endemic poverty and economic insecurity. One

woman explained: “The rice is never enough, we plant each year but the snails eat it all. There is nothing left for us to do but cut trees” (June 2015).

While villagers are themselves—in some cases at least—involved in illegal logging in Xe Pian and thus are not passive participants in these globalized networks of trade, they participate on a highly uneven field. Villager participation in the logging of rosewood and other species, even where legal, led to a spate of arrests between 2012 and 2013 and heightened tension between local communities and the military. A village leader recalled one particular incident in March 2013: “We had gone to the forest to collect timber for the construction of a house for [a new family]. When the military came I fled deep into the forest. The others, though, they got caught.” In this case, seven local community members were imprisoned by the military and their equipment, hand-tractors and timber confiscated. A development practitioner working in the province lamented: “The villagers [involved in timber harvesting] are really struggling. They have to work in these dangerous conditions and fear getting caught between the forest and the sawmill. But the people at the top—the very people they are afraid of—they are the ones really doing well from this, making a lot of money” (June 2015). While these conflicts centered on high-value rosewood, the spatial distribution of these timber species within village areas has had implications for the control of space more generally, destabilizing local resource governance. One village elder explained: “In the past, if people from other villages wanted to come and collect things from the forest, they would come to us and ask. Now the military has taken over. They told us ‘this forest belongs to the army now.’ Now people from other villages don’t even ask us anymore, they just talk to the army” (March 2013; also reported in Dwyer et al. 2015).

Contestations for the control of space and resources played out not only between local communities and the state military, but also between government agencies within the NPA. The expansion of military power throughout the NPA led directly to the retraction of the administrative space of state forestry agencies. Driving past a checkpoint in the NPA in March 2013, a forestry official commented: “These are supposed to be staffed by forestry staff as well as police and military, but now they have all been taken over by military personnel. We cannot even carry out patrols anymore, the military will not allow us.”

These contestations over space—and the governance of spatially-situated ecological resources—have all been conditioned not only by the geographic expansion of the military, but also by the discourses through which these actions have been legitimated within Xe Pian. Dwyer et al. (2015) traced the ways in which narratives of historical border insecurity have become intertwined with contemporary notions of economic insecurity relating to the leakage of valuable timber, justifying security exceptional modes of governance along Laos’ border areas. In Xe Pian, these discourses have also intersected with antecedent discourses of environmental (in)security, materializing in a fluid, changing geography as the social-ecological spaces of local communities are diminished through boundary demarcations, environmental zoning processes and, most recently, the aggressive extension of military controlled areas. This reterritorialization has undermined local community control and access to spatially-situated resources, as well as the administrative spaces of state forestry agencies, furthering ecological degradation and deforestation through extensive logging.

NEOLIBERAL ENVIRONMENTALITY AND THE COMMODIFICATION OF XEPIAN

These sorts of contestations over resource governance and access are, of course, not unique to Xe Pian. The ongoing failure of traditional ‘fortress conservation’ models with their socially-constructed conflicts between environmental and social values and, perhaps especially, a growing unease regarding the effectiveness of state administration for securing these values has given rise to a different set of discourses, propped up by a different set of assumptions. Emphasizing the contribution of the environment to the global socioeconomy through various ecosystem services, and noting that specific monetary values can be attached to these services, new forms of governance emphasize the win-win of environmental conservation—that biodiversity and other values can be conserved whilst also ensuring economic growth if the market is brought to bear upon the historically intractable problems of environmental governance. The market—particularly a market liberated from state control—may be the savior of nature, and not its nemesis. This new modality in the governance of nature, referred to as neoliberal environmentality, builds on ecological modernization but makes an important distinction by specifying that it is less the state (to the failings of which is attributed ecological degradation), but rather the neoliberal market (cast as the appropriate solution to the failings of the state) that is the most appropriate mechanism for the regulation of ‘modern nature’ (Oels, 2005).

In the face of intractable drivers of global forest loss and climate change, this form of neoliberal environmentality found material expression in Reduced Emissions from Deforestation and Forest Degradation (REDD), a market-based mechanism for securing standing forest carbon stocks. The possibility of a financial incentive for securing biodiversity values through the conservation of

forest carbon that might rival extractive use values prompted WWF to initiate the Xe Pian REDD+ project, beginning a new phase in the management of the protected area. The project design for Xe Pian REDD was submitted for validation under the Verified Carbon Standards (VCS) in 2014 and, by 2015, had become the first validated REDD project in Laos. In a sense, the NPA provided an ideal space for the implementation of REDD not only because of its substantial carbon reserves, but also because the weak ownership claims of local communities promised simpler regulatory control and decreased project transactions costs. One technical advisor explained (August 2014): “In the beginning, we considered other options, but we realized that the tenure arrangements outside of the NPA were too complicated, we would have to sign separate agreements with many different land owners. In the NPA, things were easier to control, transaction costs lower because the land was all under the Government. Also, there were stronger regulations for land use inside the NPA already, which we didn’t have outside.” These simplifications, however necessary to facilitate REDD, were not sufficient. The project had to grapple with the issue of economic land concessions for rubber plantations (which, in at least two cases, had displaced local land uses onto Xe Pian; WWF 2013), as well as the rather more intractable problem of (officially and unofficially) approved military logging and forest clearance. The former of these—the issue of land concessions—was eliminated from the project as a ‘planned’ driver of deforestation²¹ (defined by the project as processes that are approved by state authorities, even in case where the legality of these approvals could not be established (interview with project developer, 2013).

The latter problem—military spaces near the border, comprising approximately 470 km²—were similarly excised from the project. With these areas—and their associated resources uses—

²¹ To avoid incentivizing deforestation in preparation for a REDD project, VCS does not allow ‘planned deforestation’ within calculations of avoided deforestation or their inclusion within project areas.

removed from the project space, identification of the drivers of deforestation and forest degradation was simpler and, almost predictably, came to focus attention on local communities. The technical lead on the project concluded that “[deforestation and forest degradation] is mainly caused by the local population living in and around the NPA who need timber for house construction and fuel wood” (November 2011). Proposed interventions to mitigate these local drivers included boundary demarcation, improved zoning, mapping, improved law enforcement and patrolling, and greater involvement of military and police with patrols (WWF 2013: 20). That these interventions would entail livelihood impacts in an area with a high incidence of poverty was taken into consideration by project developers, who recommended that livelihood compensation be promoted, particularly through “off farm employment and agricultural intensification.” While the project was approved by VCS in 2015 without an agreed upon benefit-sharing mechanism, it was assumed that financing of livelihood compensation would be provided by the state forest agencies, to whom carbon revenues would accrue.

In some sense, the REDD project represents something new in Xe Pian, drawing on new discourses and new incentive structures. By commodifying carbon in existing forest stocks, REDD gives new values to standing trees as an alternative to timber harvesting or the conversion of forest for cash crops. Still in its early stages, it remains to be seen whether REDD will be able to deliver on both its environmental and social promises in Xe Pian. We may anticipate a little, however, by noting that there are reasons for concern. REDD articulates market-based solutions to issues of forest governance in ways that may reinforce, rather than challenge, the existing status quo (Okereke 2006). In the case of Xe Pian, this is manifested in the way that REDD assiduously avoids the thorny issues of plantation concessions and the problematic, and legal-exceptional operations of the military by extracting the geographies in which these dynamics

operate from its project space, thus truncating the possibility of engaging with what may possibly be the key drivers of forest change in Xe Pian (see Dwyer and Ingalls 2015 for a more detailed analysis). Further, limiting its spaces of engagement to those impacted by local livelihood practices, REDD not only valorized a narrative that positioned local communities as agents of degradation it also reproduced historical—and socially problematic—approaches to redefining the social-ecological spaces of local communities. Through the creation of new market values, and by directing the revenue derived from these values toward state agencies, REDD may also construct new conflicts between local forest users and forestry officials where carbon and non-carbon values compete (Wilson and Howarth 2002).

The creation of any new value intersects with existing values and contestations and may variously reproduce or change them. The enabling conditions within Xe Pian that facilitated REDD—large carbon stocks, heightened regulatory control and limited local ownership claims— were, of course, the legacy of PM164 (GoL 1993) and subsequent measures to maintain forest stocks by delimiting the territorial claims of local communities and to foster greater government control. Whatever its explicit and implicit assumptions and promises, REDD was thus not introduced into a blank and undifferentiated space. Rather, it mapped out problematically across a sociopolitical space that has been shaped by antecedent resource claims, regulatory controls and spatialized power networks (see also Buizer et al. 2014). In this sense, REDD is less new than it was presented to be. The proposed activities of REDD, the distribution of its costs and benefits, all reflect and reproduce pre-existing power asymmetries, the governmentalizing technologies in which these asymmetries find material expression and the discourses that legitimized them. As with previous interventions in Xe Pian, REDD links these local social-ecological systems to global networks of power, this time through the global carbon

market. How these new networks of power impinge upon these systems, and with what implications for social-ecological processes and outcomes, will likely play an important role in the resilience of these systems far into the future.

CONCLUSION

I have sought to demonstrate that analysis of the spatial dimensions of complex systems necessarily entails the unbundling of the social relations in space and through time and the interrogation of the unequal power asymmetries that constitute and politicize the social-ecological system. Contestation across these social relations involves not only a range of actors but also an equally broad range of attributed values. Xe Pian as, variously, a livelihood resource, a habitat for species of global significance, a source of commercially valuable timber, or a source of carbon as a solution to global climate change or a new monetary value, form the objects of these contestations which may or may not overlap in space and time. These contestations are bound up in (not only) socially constructed discourses that (de)legitimize the claims of competing actors who compete, but do so across a very uneven terrain. These legitimizing discourses—invoking (for example) conservationist necessity, national security or the urgency of climate mitigation—draw on other, cross-scale networks of power including (not only) international conservation organizations, military institutions and actors or global carbon markets forces. While these contestations change through time as new values and discourses are introduced, they also build upon one another and are shaped by antecedent landscapes of power, shaping the outcomes of particular policies in practice. All find material expression in particular social-ecological outcomes in real-world systems. Power relations become written onto the spaces of social-ecological systems through patterns of access, inclusion, exclusion and control

across space and through time, with important ecological implications relating to diverse environmental values such as (but not only) forest conditions and biodiversity.

This also has important implications for the practice of resilience scholarship. The discourses that (de)legitimize various approaches to ordering social-ecological relations across space-time enjoy varying degrees of purchase amongst coupled-systems researchers and help to form the taken-for-granted frames of reference that inform resilience scholarship. To whatever degree researchers variously draw on, support or undermine these narratives they become active agents in these contestations. This all suggests to me a fruitful line of enquiry. Further research needs to be done in untangling the spatialities of power within social-ecological systems across a range of settings including, for example, how power manifests itself during armed conflict, during periods of institutional change, or how these processes might intersect with global environmental change.

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CHAPTER 5: RESILIENCE ON THE MARGIN- INSURGENCY, AGENCY AND CONFLICT IN AFGHANISTAN'S SPIN GHAR

ABSTRACT

Despite important advances in recent years, there remain key gaps in our knowledge of society-nature interactions during periods of armed conflict. Drawing on research along the Pakistani border in eastern Afghanistan's embattled province of Nangarhar, we address this lacuna by exploring social-ecological change dynamics within a watershed that has figured prominently in two periods of conflict: the Soviet conflict of the 1970s and 80s and the ongoing conflict between U.S. and Coalition forces, the Afghan government, and an entrenched rural insurgency. Based on field surveys, geospatial analysis of remotely-sensed data and participatory research among local communities, government agents, and military actors, we identify several causal processes linking conflict and key social-ecological values and explore the relation between these local processes and multiscalar geopolitical dynamics in the region. Our research highlights the importance of center-periphery relations and the ways in which local social-ecological elements—in this case timber and opium poppy—become politicized within competing narratives of security and state-building.

INTRODUCTION

In early December, 2001, a remote complex of caves high in the Spin Ghar (White Mountains) along the Afghan-Pakistani border was thrown onto the world's stage as Coalition Special Forces and Afghan militia convened on a small band of terrorists. Prior to the events of that December, Tora Bora was known only to a few outside of Afghanistan, but was set to become a household name across much of the world. Despite hundreds of airstrikes and the deployment of some of

the world's most advanced military units from the United States, Great Britain, and Germany, on or around December 16th Osama bin Laden and his bodyguards escaped Tora Bora and passed unhindered into Pakistan's tribal territories (Kerry 2009). The months leading up to this momentous week had seen a series of events which have re-shaped modern Western political history: the spectacular attacks on the United States on September 11th, followed by Coalition invasion of Afghanistan in October and the collapse of the Taliban government. Perhaps, few would have predicted that 14 years later the greatest military power that the world has ever seen would have proven unable to subdue this remote mountainous area in one of the world's poorest countries. Through this prolonged period of conflict several dynamics predominate. Endemic poverty within focal areas of the conflict has worsened while environmental conditions across a range of indicators, from forest conditions to the quality of rangelands and water, have steadily—and sometimes rapidly and catastrophically—eroded. The Taliban and other Anti-Government Elements (AGEs) have mounted an increasingly lethal insurgency that has grown in strength, now dominating large areas of eastern and southern Afghanistan concomitant with the near-total conversion of agricultural areas to opium poppy and the emergence of a robust, if problematic, narcotics trade. The erosion of the security situation and the dramatic changes in local social and environmental conditions certainly begs a number of questions relating society-nature dynamics during armed conflict. Further, while the conflict in Afghanistan was ostensibly prompted by geopolitical and security triggers, it has increasingly become entwined with environmental resources—timber, poppy, and land—prompting questions of antecedency and causality, whether environmental decline has prompted or exacerbated conflict, or is first and foremost an outcome of it.

Scholarship seeking to understand the connection between environmental conditions and armed conflict has tended to coalesce around two overlapping literatures. The first of these, the so-called ‘environment-conflict hypothesis’ (see for example Homer-Dixon 1991, Percival and Homer-Dixon 1998 or, more recently, Brunnschweiler and Bulte 2009) suggests that environmental degradation and resource scarcity prompt social responses such as the capture of resources by elite actors or powerful social groups and the marginalization of weaker actors, prompting violent conflict. The second area of scholarship has tended to reverse this causality, suggesting rather that armed conflict is more likely to arise under conditions of resource abundance (the so-called ‘resource curse’ see for example Collier and Hoeffler 2004) wherein states that are rich in resources and are largely dependent on these tend to be characterized by socio-political systems of patronage, lack rights-based legal systems and are prone to corruption, all of which give rise to a ‘weak state’ prone to armed conflict. Scholarship interacting with each of these broad thought-clusters have suggested other confounding dynamics, such as the ‘rough terrain’ argument wherein armed insurgency is likely to arise in mountainous or forested areas due not to the abundance of resources but rather distance from state power (see Fearon and Laitin 2003, Rustad et al. 2008).

Empirical studies—generally involving large global or regional datasets—have tended to support the contention that there is a positive relationship between environmental conditions and conflict (Gleditsch 2001) and yet has been quite equivocal with regard to the direction of the causal relation, seeming to provide adequate evidence for both positions. This is all a very important debate, and one to which I anticipate this chapter will contribute. Nevertheless, I engage somewhat obliquely with these framings, taking as my point of departure three observations. First, while degrees of resource endowment or degradation may play a role in conflict, economic

or political dynamics often confound or overwhelm these. Second, aggregate analyses of national-level data sets have tended to ignore potentially significant sub-national variations in these causal relations (Raleigh and Urdal 2007). Third, and perhaps more importantly, such studies tend toward a degree of determinism that ignores local agency (Tidball and Stedman 2013) and have not adequately explored the local causal mechanisms that shape nature-society relations under conditions of armed conflict (Deligiannis 2012).

I suggest that approaching nature-society relations as co-constituted elements (Freudenburg et al. 1995) of a complex social-ecological system provides a potentially useful way forward, allowing for the exploration of multi-dimensional human-environment relations under conditions of armed conflict. Analytic approaches that have explicitly taken such a coupled-systems approach—and have linked this approach to the interrogation of how social-ecological systems negotiate change pathways and remain resilient—are particularly of interest. Social-ecological systems resilience thinking, sometimes referred to as the resilience approach, conjoins a number of elements, but I will selectively focus on four. First, the ability of a system to adapt to disturbance relates in part to the degree to which the system is able to self-organize by creating, sustaining and actively modifying the diverse dynamic processes that impact on the system (Carpenter et al. 2001). Second, the spatial organization and mobility of various elements—communities, resources, and boundaries—play an important role in enabling or constraining adaptive response to change (Cumming 2011, Ingalls and Dwyer 2015). Third, power and conditions of governance—including decentralized decision-making, accountability, transparency, and legitimacy—play an important role in building or eroding resilience (Fabinyi et al. 2014, Ingalls and Stedman 2015). Finally, all systems are impacted by processes below and above them along both spatial and temporal dimensions. Local-level events may aggregate upward to affect large-scale processes,

while higher-scale influences such as regional and global market dynamics, political networks or climate regimes, act downward to either support system resilience or to undermine it as they map onto the particular conditions of the system itself (Cash et al. 2006).

While the resilience framework provides a potentially useful guide for this analysis, it has had only a very limited application within armed conflict environments. Ratner and others (2013) have addressed how resource-based institution building in conflict-sensitive environments may contribute to reducing conflict and strengthening resilience of social-ecological systems to prevent or resolve conflict. Yabiku and others (2014) explored resilience through management of resources in the context of Nepal's ongoing civil conflict, noting that forest user groups managing large areas with complex bureaucratic arrangements tended to suffer most from conflict. Despite these important advances, more research needs to be done to elaborate a resilience-based approach for understanding social-ecological dynamics during armed conflict. My work addresses this need, focusing on causal pathways of social-ecological change and how these pathways are rooted in multiscalar dynamic processes, and the implications of these for coupled systems functioning. I do this by exploring social-ecological processes in the area surrounding Tora Bora in the Chaparhar watershed located in Nangarhar Province (as a particular case), how these have changed throughout a period of prolonged conflict, and suggest some causal pathways through which these social and environmental changes have occurred. Because these processes are embedded in and intersect with the broader geopolitical conflict complex in the region, I will first scan across recent periods of conflict—reaching back somewhat to conflicts antecedent to 2001—and the political-discursive framing of security and state-building, with a particular focus on Afghanistan's eastern region and, especially, Nangarhar Province. Subsequently, I will tentatively trace out several local causal pathways of change

relating to environmental decline and land use change and link these to regional and historical processes to local-level outcomes, focusing on the politicization of social-ecological processes relating to forest management and timber trade, rangelands, and the opium trade.

CONFLICT, INSURGENCY AND STATE BUILDING IN EASTERN AFGHANISTAN: 1979 TO THE PRESENT

Contemporary political and military struggles and associated dynamics of environmental and social change in the Chaprahar watershed trace their origins from events in the 1970s and 80s²². In a bid to advance geopolitical territorial interests in Central Asia (and possibly to secure warm-water ports in the Persian Gulf; see Dibb 2010), the Soviet Union invaded Afghanistan on the pretense of stabilizing a nation that had fallen into civil war and to succor the largely unpopular pro-communist government of the Democratic Republic of Afghanistan. In what has since been called the “great miscalculation”, Soviet military strategy focused on control of urban centers, ostensibly on the assumption that this would suffice to control the rural peripheries (Dibb 2010). Soviet forces were quickly bogged down in a prolonged conflict with an entrenched rural insurgency. A key base of this insurgency was the Mujahideen, operating throughout Afghanistan’s eastern region but especially in Nangarhar Province along the Pakistani border. Alongside ethnic Khogyanis, Shinwaris, and other local Pashtun-speaking tribes, the Mujahideen also comprised of a number of non-Afghans ideologically opposed to the incursion of Soviet forces, including the young Osama bin Laden and Abu Musab al-Zarqawi, who would go on to found Al Qaeda and the Islamic State (ISIS, or Da-esh), respectively. In this conflict, the

²² There are grounds to reaching further back, to the geopolitical struggles between the Russia and Great Britain during the so-called “Great Game” of the 19th Century that, interestingly, also focused on these same areas and the Khyber Pass to the east.

interests of the United States government and those of Pakistan found common purpose. While the U. S. wanted to block the territorial expansion of the Soviet advance toward the Middle East—and perhaps also to open a corridor from Pakistan through Afghanistan to Soviet Central Asia (Grare 2006)—Pakistan sought to disrupt the long-standing alliance between Kabul and New Delhi (ICG 2014). The Central Intelligence Agency and Pakistan’s Inter-services Intelligence (ISI) (Dupree 1988) capitalized on transboundary tribal networks and the porous national border to provide the Mujahideen with arms and financial assistance, a large proportion of which accrued to Nangarhar Province (Jackson 2014). After a decade of conflict, the Soviet Army was ultimately unable to subdue the tribal areas and, in 1989, withdrew from Afghanistan, arguably triggering the fantastic disintegration of the Soviet Union the following year (Dibb 2010). The decade of conflict had, however, taken its toll in Afghanistan: an estimated 1.3 million Afghans were killed and a further 5.5 million had fled the country.

Beyond the immediate loss of life and the destruction of key infrastructure resulting from the Soviet conflict, there have been several other lasting legacies that played a key role in shaping contemporary social-ecological dynamics along the Afghan-Pakistani border. Significant among these impacts is the erosion of tribal norms and governance under the Shura, or tribal council, that traditionally played a central role in tribal governance in these peripheral areas. Unlike the Shura, who were largely accountable to local communities and whose legitimacy was conferred by their age and knowledge of traditional systems, legal codes, and their ability to facilitate resource governance, the Mujahideen commanders who came to power during this period were largely young men with military experience and ties to militia groups in Pakistan’s former Northwest Frontier Province, establishing and maintaining their authority by force of arms and funding provided to them through the United States (Cramer and Goodhand 2002). A second key

impact relates to how these militant groups funded their operations. As U.S. funding streams dried up following the withdrawal of Soviet troops, Mujahideen commanders increasingly turned to timber, the seizure of range and agricultural land, and the cultivation of opium poppy to finance their militias as rivalries between various commanders became increasingly volatile. These internal rivalries came to a head in 1992, erupting into armed conflict and paving the way for the emergence of the Taliban, which established power in Kabul. In the years that followed these powerful figures remained, in some sense, in the background only to re-emerge during the fall of the Taliban less than a decade later.

In the years following 2001, the U.S. came to deal with these same structural issues that it had previously capitalized on and, in an important sense, created. Powerful militant groups based in territories on the peripheries of the state, financed largely through illicit trade in narcotics and timber and operating across a highly porous border with Pakistan became a key liability for the reorganizing Afghan state (ICG 2014). The U.S. project in Afghanistan has therefore been as much about addressing specific security threats as about the creation of a modern polity according to a particular narrative of state building that involved a strong, centralized state surrounded by a well-bounded and obedient rural periphery (Parkinson 2010). But the geographical imagining of western military powers in Afghanistan encountered alternative spatial configuration of power where local Pashtun communities in remote areas marginal to the state—ambivalent in their political obedience—posed a risk. While U.S. and other development assistance focused almost exclusively on developing and supporting strong, centralized governance structures in Kabul until at least 2004 (Jackson 2014), the rural margins remained problematic and increasingly became the focus of military and political intervention. Then Senator Kerry's (2009) report to the Senate Foreign Relations' Committee warned of the

“unregulated” tribal areas and, in 2010 (page 17) lamented the “virtually invisible line” that forms the border between Afghanistan and Pakistan across which an elaborate structure of social networks—and, increasingly, a lucrative trade in timber and narcotics entwined with insurgent forces—had become a vexing problem for the central state.

One barrier to effectively governing the peripheral-state spaces along the margins of the eastern region and the Pakistani border was perceived by state-makers to be traditional governance arrangements, including the institution of the tribal Shura (Lee 2007) and tenure arrangements dependent on collective social memory. Thus, despite the historic role played by the Shura in the governance of natural resources, the adjudication of disputes and inter-tribal negotiation, international aid agencies supported the institution of a new governing institution at the local level, Community Development Councils (CDCs), under the National Solidarity Program in 2005. Similarly, and in an effort to clarify land tenure and promote foreign investment, a centralized land titling system was created under the mandate of the Afghanistan Land Authority. These two mechanisms were intended to regularize tribal governance systems and render them legible to the central state (Groninger et al. 2013).

These and other efforts to limit the power of peripheral powers—not only of the insurgency and former Mujahideen commanders but also that of tribal leaders—required leadership at the provincial level that was not only effective, but was accountable to Kabul. Pursuant to this, President Karzai appointed Gul Agha Sherzai as Governor of Nangarhar in 2005. Prior to this, as Governor of Kandahar Sherzai had earned a reputation both for corruption and extensive patronage systems and for his heavy-handed mode of governance, earning him the appellation “The Bulldozer” (Mansfield 2014b). He was also a long-time favorite of some Western powers, having played a key role in the U.S. and Coalition invasion of Kandahar in 2001 and being

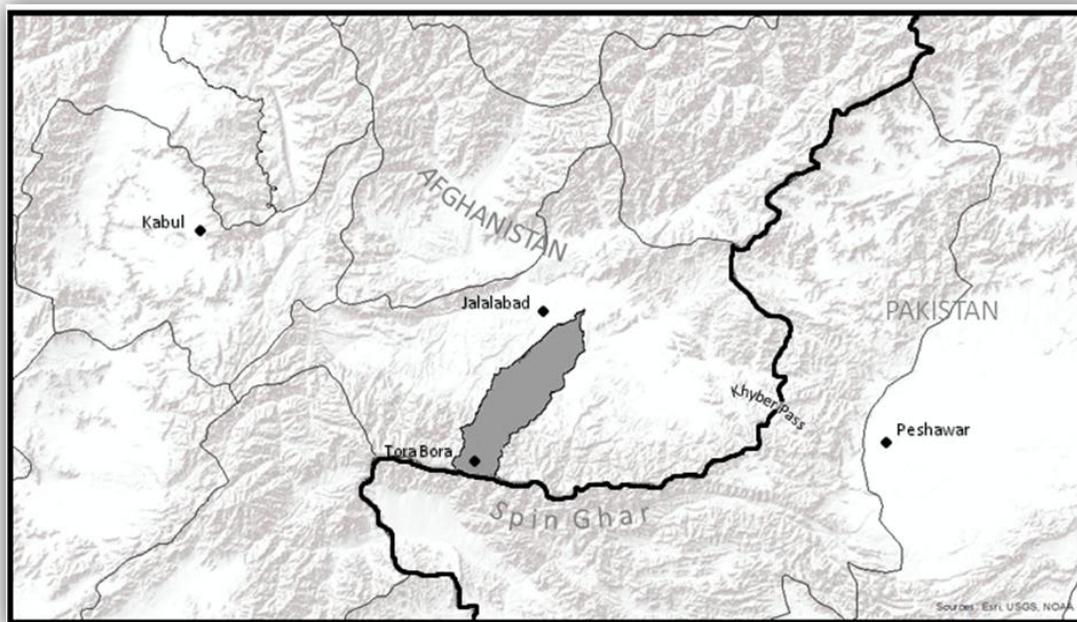
known as an effective (if power-mongering) leader (Mukhopadhyay 2014). His initial years proved successful as he coerced and negotiated alliances toward achieving effective, if temporary, political objects of state-rule: extending the reach of the state into the remote areas of the province, pushing back antigovernment elements, suppressing poppy cultivation and intervening in the transboundary trade of timber. While Sherzai's heavy-handed approach to managing the remote regions of Nangarhar was effective in achieving some key objectives of the U.S. backed Afghan authorities in Kabul, reallocation of funds and natural resources toward allies, and pervasive corruption continued to foment broad-scale displeasure with what was regarded by many as the bullying of an outsider (Mansfield 2014a). By 2010, Sharzai's power began to wane as the insurgency gained strength and geographic reach with an increasingly broad base of local support. In late 2013, amid growing opposition not only from the insurgency, but also from former Mujahideen commanders in Jalalabad, Sherzai resigned as Governor.

While the insurgency in Afghanistan is often referred to as “the Taliban,” anti-government resistance in the eastern region is complex, representing not only formally incorporated elements, but also an increasingly broad base of support from local leaders and communities. The *Tora Bora Nizami Mahaz* (the Tora Bora Front) has had a strong presence in Nangarhar Province, including Pachir Wa Agam since its formation in 2007 under the leadership of Anwar Haq Mujahid. The group claims ties to Mohammad Omar, the founder of the Taliban movement in 1992 who fled to Quetta, Pakistan in 2001 and remained the leader of the Taliban-in-exile until his death in 2013. Other groups operating in the area vary from those that are more local in origin, to those which are considered ‘Pakistani Taliban’, such as armed insurgents under the leadership of Mangal Bagh, which are known to operate in nearby Achin (Mansfield 2014). By 2015, new groups emerged, claiming allegiance to the Islamic State of Iraq and the Levant –

Khorasan Province (ISIL-K, or Da-esh). As the insurgency has continued to gain ground, Afghan government presence became largely relegated to urban areas and a few outposts, which, according to local informants, regularly sustain armed attacks. The entrenchment of the insurgency and, primarily, the emergence of Da'esh in these areas, prompted the resumption of U.S. air strikes in 2016 (New York Times 31 January 2016).

CHAPRAHAR WATERSHED: CONTEXT AND RESEARCH APPROACH

Within this context, I will explore social-ecological dynamics within an area that has figured prominently during these periods of conflict, focusing on the Chaprahar watershed in Nangarhar Province, eastern Afghanistan that lies along the northern piedmont of the Spin Ghar (or Safed Koh, in Urdu) Mountains (Figure 4). More particularly, I will focus attention on its upper reaches in Pachir Wa Agam District terminating in Tora Bora, along the Pakistani border. In order to elucidate local processes in light of this broader context, however, I maintain a degree of fluidity



in
both
space
and
time;

looking at conflict processes within the social-ecological system backward in time—but focusing

especially on the period since 2005—and outward in space to encompass relevant dynamics in neighboring districts and Nangarhar more generally.

Figure 4: Chaprahar watershed in context

The Spin Ghar Mountains, forming the headwaters of my study area, lay along the western end of the Himalaya Forest Complex, a unique ecological zone in western Asia that provides a significant proportion of the region's endemic species (Delattre and Rahmani, 2008), a key regional resource for timber and other forest products, as well as the headwaters for key river systems such as the Indus River. Lower elevation forests are generally comprised of broadleaf species, such as evergreen oak (*Quercus dilatata* and *Q. baloot*), and the economically important walnut (*Juglans regia*), while at higher elevations (2,000 – 3,000 m) conifer forests comprising of the aromatic Deodar cedar (*Cedrus deodara*), pine (*Pinus wallachiana*), and others predominate.

Dominated by the Pashtun-speaking Khogyani tribe, there are approximately 28,300 individuals which have settled primarily in the middle and lower-elevation areas of the catchment within Pachir Wa Agam District. The mountainous, upper elevation areas of the district surrounding Tora Bora lie along the northern face of the Spin Ghar Mountains and are characterized by a steeply sloping topography, sparse forest cover, and arid montane ranges.

While Nangarhar Province as a whole has the lowest per capita availability of land in Afghanistan (Roe 2008), Pachir Wa Agam fares yet worse than many districts closer to Jalalabad, with high poverty rates and food insecurity (Mansfield 2010, Ingalls 2011). While some opportunistic crop cultivation (typically rainfed wheat and, increasingly, opium poppy (*Papaver somniferum*); see below) occurs in the southern, higher elevation areas surrounding Tora Bora, the lower elevation areas in the northern part of the district exhibit a higher

proportion of cultivated land and a greater degree of crop diversity including wheat, maize, potato, and other vegetables for local consumption and for sale in local markets. The majority of agricultural production in Pachir Wa Agam, especially in the higher-elevation areas, depends on intermittent rainfall. With less than 17 cm of precipitation annually, and overall net moisture deficiency due to high rates of evapotranspiration, irrigated agriculture throughout the watershed is heavily reliant on the capture of snowmelt during the early spring (March-May). Traditionally, snowmelt from the Spin Ghar is captured and transported to irrigated areas through the use of *karez*, subterranean stone channels that have been managed by local communities for, in some cases, centuries.

In order to understand ecological changes during this period, GeoEye and Landsat remotely-sensed images were obtained and analyzed with regard to topography, snow and ice accumulation, and land use and land cover between 2005 and 2009. Satellite imagery for 2004 to 2013 was analyzed to determine rates of poppy cultivation, supplemented by annual field surveys between 2004 and 2015. Forest cover data were obtained for the years 1998, 2008, and 2009 to identify forest cover change. In order to understand local social dynamics, drivers of change, local perspectives of social and ecological processes (including drivers of poverty, agricultural and ecological change, governance, and issues related to security and military conflict) focus group discussions with tribal elders representing settlements throughout the catchment (n=53 individuals) on three separate occasions between 2010 and 2011 under the United States Agency for International Development (USAID)-implementing agency Development Alternatives Inc. (DAI), with interviews and field surveys carried out by the second author with local residents and tribal elders throughout Nangarhar Province (n=1,050) since 2010, but drawing on field work beginning in 1997 under the United Nations Office of Drugs and Crime (UNODC). Key

informant interviews with government officials at national, provincial, and local-levels; local residents; military personnel; and national and international experts (n=26) were carried out between 2010 and 2015 to identify key changes in the research area with regard to resource governance, dynamics of conflict and security, environmental conditions and agroecological change. Published and unpublished field reports from the UNODC, the Afghan Research and Evaluation Unit (AREU), DAI, and the Natural Resources Counterinsurgency Cell (NRCC) operating under Task Force Mountain Warrior, classified documents available through Wikileaks and websites of the Islamic Emirate of Afghanistan (Taliban), and affiliated groups were used to provide supplementary information and to corroborate informant reports.

LOCAL LIVELIHOODS: MOBILITY IN SPACE AND TIME

Local communities within the Chaparhar Watershed exhibit a high-degree of resource dependency (MRRD 2012) wherein communal forests, rangelands and agricultural areas play a key role (Ingalls 2011). Traditionally, the use of these communal resources has been managed through a complex system of tribal norms and customs, guided by the tribal Shura that adjudicates disputes, and manages relations with neighboring tribes and government authorities across tribal areas that extend from Jalalabad well into Pakistan.

Due to its intense aridity, water is a limiting resource during much of the year and thus seasonal and inter-annual variation in water availability from precipitation, but primarily snowmelt from the Spin Ghar, creates the boom and bust cycles of vegetative growth characteristic of arid agroecological environments. Local livelihood adaptation involves spatially and temporally mobile and diverse strategies to capitalize on these patterns. In the more mountainous, southern areas of the district, many households have traditionally depended on forest resources for timber

and non-timber forest products (NTFPs). Timber from the highly-valued Deodar cedar in the upper forested areas and evergreen oak from in the middle-elevation broadleaf forests are logged and sold across the border into Pakistan (and thence to the Middle East) while NTFPs such as the seeds of the Chilgoza pine (*P. gerardiana*) and wild mushrooms that are collected and sold to in?? Jalalabad, and subsequently marketed to Pakistan and India, as well as numerous wild roots, leaves, and other species used locally for consumption, as traditional medicines or perfumes (interviews and field surveys, 2010, 2011).

Due to the mountainous, arid topography of Pachir Wa Agam the herding of small ruminants, especially local breeds of fat-tailed sheep and goats, on the extensive rangelands in the medium and higher elevations of the Spin Ghar piedmont provides the basis of livelihoods for many resident households as well as nomadic Pashtun-speaking Kuchi who have historically accessed range areas under agreements with the tribal Shura. Local residents report that there are an estimated 18-19,000 hectares of traditional, community-held rangelands distributed across the middle and upper reaches of the watershed (Figure 5).

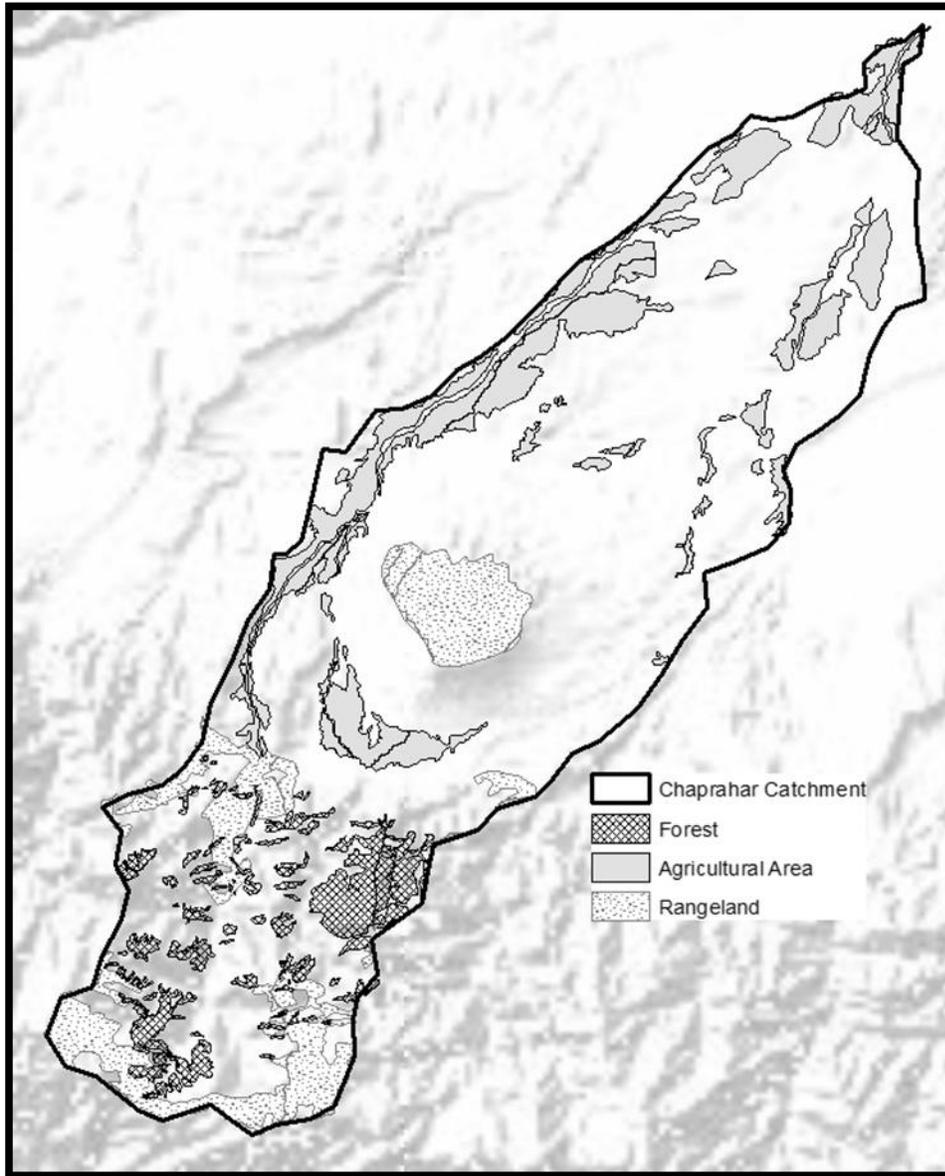


Figure 5: Agroecological areas in Chaprahar Watershed

Ruminants belonging to local communities and also, traditionally, those belonging to the Kuchi are commonly pastured in the community-held ranges of the upper watershed during the spring and summer months, when forbs and grasses are most abundant and irrigated areas in the lowlands are cultivated for wheat, maize, and vegetable production. In the winter, herds are moved into the protection of villages, where they browse fallow fields for crop residues or are

penned and fed fodder (typically gathered from the communal range). According to local herders, stock sizes are increased during periods of abundant rainfall to take advantage of temporarily-abundant vegetation, but during periods of drought communal ranges are destocked and excess animals are sold to Pakistani traders on the south side of the Spin Ghar, where goats and sheep command higher prices.

According to local participants, traditional agricultural production of wheat, onions, and other vegetables crops has been a mainstay for local consumption, with excess sold to in? Jalalabad and elsewhere. Recent years have, however, seen the near-total conversion of cultivated land to the production of opium poppy. As a crop particularly suited to stochastic variations in land and water availability, it produces quickly on arid soils, and is resistant to drought conditions and pests. The latex produced from poppy buds has a long shelf-life, is easily transportable, and has a high per-unit value. Its short production cycle and high weight-value have made it especially well-suited to conditions of political and military upheaval, and thus it has played a key role as a local adaptation to insecurity. A dominant land use within the catchment and the basis of local livelihoods as well as a primary source of financing for the insurgency, it has also become a key political object in the current conflict, a point that I will return to below.

Traditional livelihood and local governance systems have been shaped by the increasingly volatile conflict in recent years. Local communities, and the social-ecological systems within which they are embedded, overlap and interact with multi-faceted insurgent forces opposed to state rule and broader geopolitical dynamics involving (not only) Pakistan, Kabul, and western Coalition forces. Complex tribal loyalties— running along tribal networks and along lines of solidarity based on Islamic commitments as well as economic and political concerns—and a marked resistance to outside control have fostered a degree of pragmatic ambivalence among

local communities toward the politico-military interests of Kabul and Coalition forces. For example, during the hunt for Osama bin Laden in Tora Bora 2001, Coalition Special Forces units were mired by the political ambivalence of local communities in Pachir Wa Agam. On the one hand, Coalition units depended heavily on local informants regarding the location of Al Qaeda troops and weapons caches while, on the other, were unable to establish the large-scale presence needed to secure the border area due to the distrust of Coalition forces by local communities and their sympathies with Al Qaeda (Kerry 2009).

While the influence of Pakistan-based insurgency groups has always been important, the insurgency in recent years has become increasingly local, even as it increases in strength. One tribal elder in Pachir Wa Agam explained: “Poverty is the main reason for young men joining the insurgency” (July 2010), while other respondents also indicated that fear and coercion have played an important role in recruitment. Other motivations may also be important. For example, the NRCC conducted a study seeking to understand insurgency recruitment patterns and found that, alongside theocratic sympathies, two key motivations were a desire to protect their communities from outside influences and family or tribal loyalties (Bader et al. 2013). According to local residents, families spread out risks by managing their alliances, sometimes with the same family having members in insurgency militias as well as in government employment, such as with ANA, giving them access to government services and salaries (field interviews 2014).

While tribal elders and local people have managed risks through fluid alliances and overlapping loyalties, this has never been unproblematic. Fragmentary and divisive relations not only been the insurgency and government forces, but also within and between various insurgent groups themselves have also been violent. Much of the tribal leadership involved in the early stages of my research process have, according to one local respondent, “been killed or have fled”

(February, 2015) in response to insecurity as well as in-fighting among local leaders and powerful individuals. This has perhaps become more problematic in recent months, as new groups (and reformulations of old groups) have identified themselves as Da-esh. According to local informants, tribal elders allying themselves with Taliban elements have been the targets of assassinations by Da-esh militants (interviews, 2015).

Decades of conflict in the Chaprahar Watershed have resulted in several social-ecological outcomes. Local residents describe the erosion of social and ecological conditions across a range of indicators, particularly in the years following 2001. Deforestation has occurred at an alarming rate. Remote imagery indicated a 22% decrease in forested area throughout the district between 1998 and 2009 (Figure 6), for example, with residents reporting that the pace of deforestation has increased since 2010. This is generally consistent with broader trends of deforestation in Afghanistan's eastern region where an estimated 70% of the region's forest was lost between 1977 and 2002 (UNEP, 2003). Rangeland areas have also been negatively impacted, with residents reporting not only a decrease in the area of these ranges, but also trends of desertification, with many range areas no longer being able to support stocks during dry periods.

The erosion of shallow soils from previously forested areas and associated ranges has resulted in a substantial increase in downstream sedimentation creating a broader, shallower stream profile, which likely exacerbates flooding events. While base-flows during late summer are less than 0.3m^3 per second, flow volumes may increase 60-fold (Ingalls 2011). Residents reported a noticeable increase in flash flooding and high-flows during rainfall events, some of which have been catastrophic for downstream communities (such as flooding in late 2010, where stream discharges reached 20 m^3 per second, causing considerable damage to crops, local infrastructure, and some loss of life). Local elders report that sedimentation of irrigation intakes and canals has

led to a significant loss of conveyance efficiency and an overall decrease in irrigation command area, leading to shortfalls in agricultural production. Instability and risks associated with accessing market areas and travel along roads have also depressed agricultural production and trade, exacerbating long-term conditions of food insecurity and poorly implemented (or non-existent) social protection mechanisms. Local residents report increased incidence and degree of poverty, worsening food security, and numerous obstacles to accessing healthcare and educational services. Systemic corruption within public institutions, even where these exist, significantly reduce any potential benefits that local communities might receive from the substantial aid funding that has been poured into Nangarhar Province in recent years.

Understanding the causes of social-ecological change and degradation in any system is necessarily complex; perhaps particularly so during periods of armed conflict. My findings suggest that this is further complicated by macro-structural dynamic processes that intersect with and express themselves through a number of local-level causal mechanisms. These dynamics—including the intersection of global military powers with local political and military institutions, the porosity of these marginal areas along the border, and the contestation of state power—have all been influential in shaping the conditions of the social-ecological system in Pachir Wa Agam. In the sections that follow, I will trace out the causal pathways, selectively focusing on illegal logging and trade networks, the erosion of communal rangelands through encroachment, land grabbing and changing pastoral responses to conflict, and significant land use changes in the agricultural sector toward the cultivation of opium poppy. This analysis highlights that each of these causal pathways are shaped by the politicization of key system elements—especially timber and poppy—tying together social and ecological domains through politico-military constructs of power, with material impacts for social-ecological system functioning.

TRACING THE CAUSAL PATHWAYS OF SOCIAL-ECOLOGICAL CHANGE

Deforestation and Illegal Logging

The logging and trafficking of timber within Pachir Wa Agam and neighboring areas has played a key role in financing the insurgency—while also providing limited livelihood benefits for some local people—and massive and unprecedented deforestation. While communities have traditionally relied upon forest resources, including timber, along the lower and middle slopes of the watershed, local residents asserted that large-scale timber extraction did not begin in earnest prior to the Soviet invasion. Logging of high-value Deodara cedar and other species became such that, by the mid-1980s the erosion of forest resources in the eastern region was considered by some to constitute the most important environmental impact of the Soviet-Afghanistan conflict (Formoli 1985). In the years leading up to the U.S. invasion in 2001, logging (both licit and illicit) was primarily carried out by Taliban leadership, allegedly in cooperation with Pakistan's ISI, as timber was moved across the Spin Ghar Mountains to Peshawar then Karachi and on to high-end markets in the Middle East, especially the United Arab Emirates (see Bader et al. 2013 for a detailed analysis of these trade networks). In the years immediately following the U.S. invasion and up until approximately 2010, local commanders, government officials, and organized crime networks had managed logging networks. The government's logging ban in late 2010, while intended to stem the loss of forest resources in the east, effectively shutdown licit timber networks creating a supply vacuum and, according to Bader et al. (2013), conditions favorable for insurgency groups and Taliban-affiliated organizations to take over the timber trade supply market. By 2011, revenue from timber sales arguably became a dominant source of funding for insurgency groups in the eastern region (though this was subsequently superseded by revenue from opium poppy, see below).

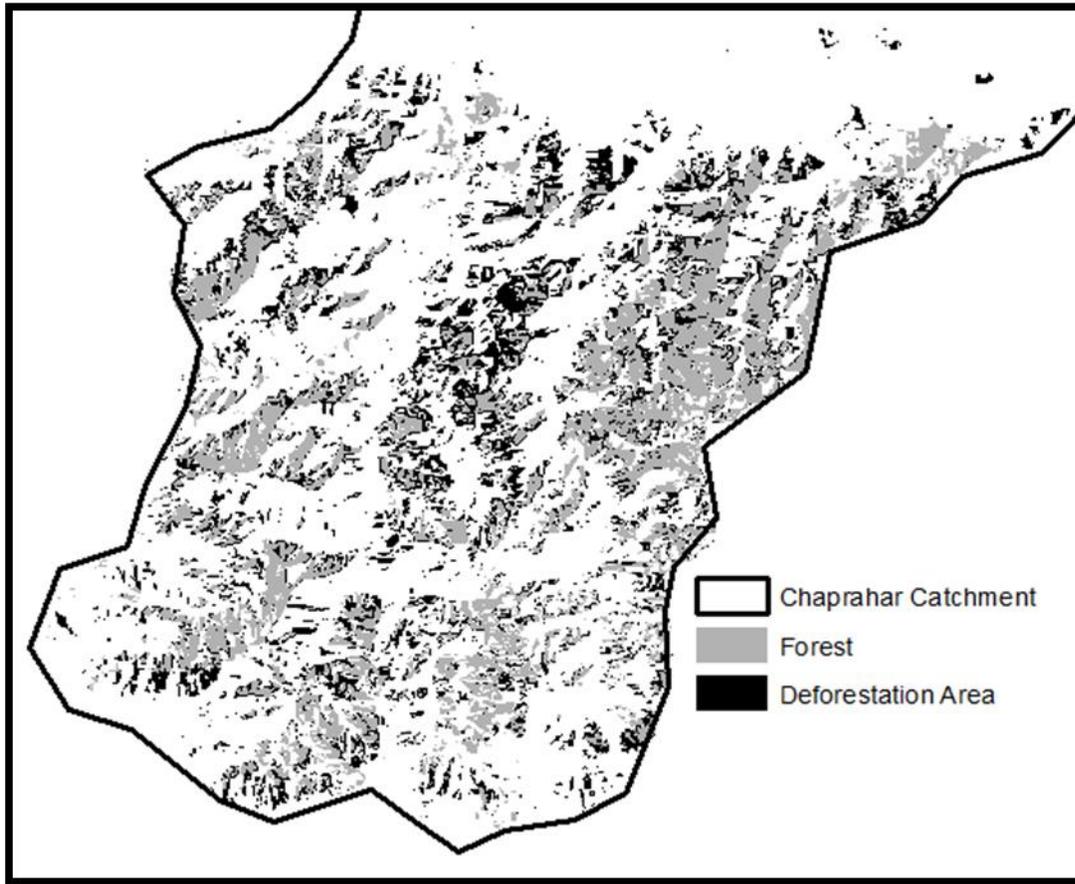


Figure 6: Forest Cover and Change 1998-2009

Inter-tribal relations have played an important, but complicated, role in forest governance and the timber trade. According to local informants, the Shinwari of Deh Bala and the Khogyani of Pachir Wa Agam have traditionally maintained agreements on the protection of shared forest resources. The breakdown in relations between these groups and their competitive exploitation of forest resources, which ensued during prolonged conflict has, according to participants, been a key factor driving deforestation. Despite this, local informants indicated that the principal transportation route for Pachir Wa Agam's timber continues to be through the Shinwari-

controlled pass in Deh Bala, a traditional export-point for timber, suggesting that some degree of cooperation exists.

At the village level, the situation is similarly complicated. In some cases, local communities have been acquiescent in the extraction of timber from communal forest areas while, in other cases, have actively resisted. For example in Melava, a village in the middle reaches of the watershed, the local community appointed rangers, paid with wheat by local families, to patrol communal forest areas and protect them from encroachment. In another case, tribal leaders complained to local commanders that taking timber from their communal forest areas was against the regulations of the Shura, but these individuals “responded with violence.” Villagers participating in the research generally expressed disapproval of the illegal logging of village forest areas, but noted that prolonged poverty left many families without a choice, and that they sometimes participated in logging and were paid by timber traders, or were too afraid to resist.

Recognizing the important role that the illegal timber trade plays in financing the insurgency, Coalition forces and the Afghan military have attempted to interrupt the trade, but have met with significant political and armed resistance, with complaints from local communities that these interventions are an intrusion into their livelihoods and were perceived as an unwelcome interference of the state, whose legitimacy has increasingly come into question (reported in Bader et al. 2013).

Range degradation and change

There is an important interrelationship between the forests of upper-elevation areas of the watershed and communally-managed rangelands, with which they are largely contiguous and interspersed. While arid agroecological conditions are the norm in these areas, local communities report that drought conditions were more severe during the period from 1996 to

2004. Armed conflict in these areas has exacerbated the erosion of rangeland ecosystems in two ways: by changing pastoral patterns of rangeland use and through the loss of tenure security and traditional lands by forcible acquisition. According to participants, traditionally-used higher elevation ranges have been abandoned by many herders due to a lack of security, concentrating herds onto the middle and lower elevation ranges around the communities, further exacerbating range pressures in these areas, trampling and the overgrazing of grasses and forbs. Long-standing tribal agreements allowing seasonal access tribal rangelands by mobile Kuchi have broken down during the period of conflict, as ranges have become increasingly degraded, but also contested. Communities report that traditional communal ranges are increasingly being encroached upon by powerful individuals and are converted to settlements or other uses, concentrating herds into smaller areas, exacerbating degradation through overcrowding in these areas.

Agricultural Change and the Rise of Poppy

While poverty and food insecurity have been endemic in the area since at least the Soviet invasion, recent years have seen further erosion of the licit agricultural sector. According to local participants, not only has market disruption reduced the commercial cultivation of many crops, irrigation networks have become increasingly silted-up due to erosion in upstream catchments and have fallen into disrepair due to a lack of labor and a breakdown in traditional labor-sharing agreements during conflict. Much of the work-force historically available for agriculture has fled the area, or has enlisted in the Afghan National Security Forces (ANSF) or one of the various insurgent groups.

A traditional response to these sorts of insecurities has been the production of opium poppy. Local communities have long relied on opium as a short-cycle, high-value and easily transportable product during periods of civil conflict, agricultural underproduction and livelihood

insecurity. Commanding higher prices than any other alternative, poppy is also the only product for which traders will travel to the farmgate to purchase, reducing the farmers' risks of transporting goods during armed conflict (interviews 2014).

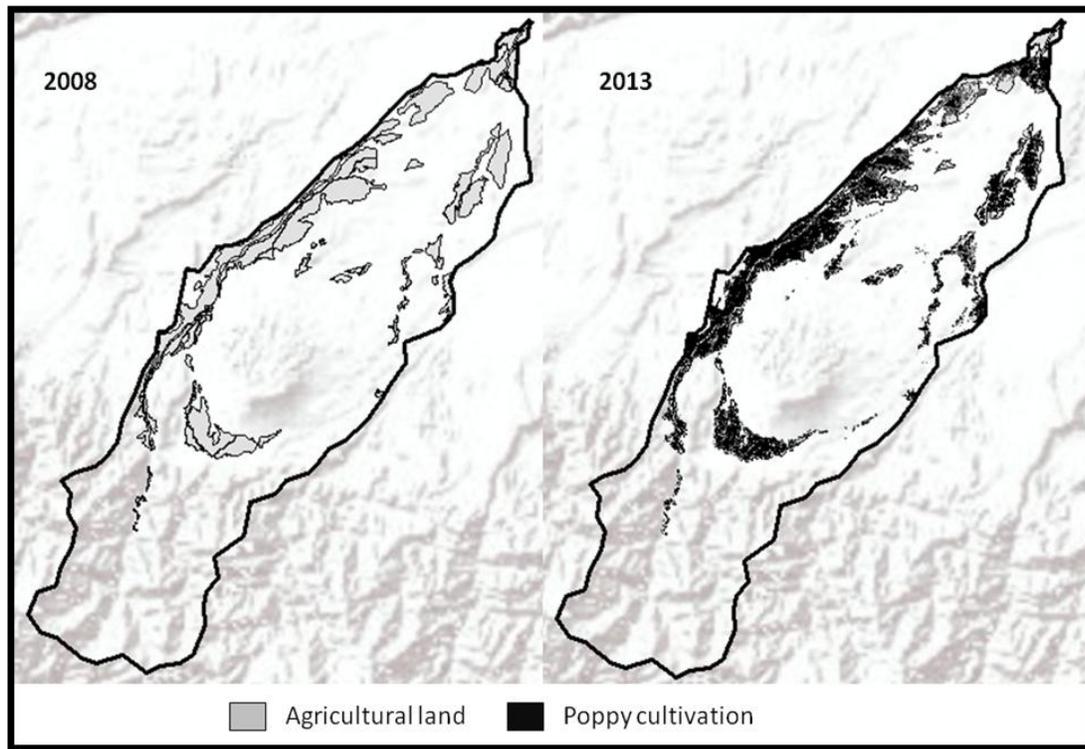


Figure 7: Change in poppy cultivation 2008 and 2013

The opium sector is inextricably linked to the insurgency as a primary source of funding. Armed insurgent groups provide loans to farmers, purchase the latex at the farmgate and transport the product across the border into Pakistan. This link to the insurgency as well as long-standing political interests on the part of the U.S. government has prompted significant political and military responses to poppy production. The Nangarhar Provincial government declared a temporary ban on poppy cultivation in 2004, which sparked significant local opposition among farmers. By 2007 a national ban on opium production had become permanent, supported by eradication teams attached to the ANSF backed by Coalition forces that destroyed poppy fields

in the lower elevation areas of the watershed near urban areas and major roads. Under the administration of Sherzai eradication efforts became at first successful. By 2008, the UNODC jubilantly declared Nangarhar to be ‘poppy-free’ and held up as a success case in the increasingly difficult effort to control the opium trade in Afghanistan (UNODC 2008). This success, however temporary, must also be seen alongside the repercussions of these efforts for local communities. Arguably, Nangarhar suffered most from the opium ban (Mansfield 2008). Communities in Pachir Wa Agam and other southern-loop districts were most vulnerable to anti-opium efforts, as they are generally much poorer and have few alternatives. Farmers who stopped producing opium had to find other coping strategies such as decreasing their expenditures for food, medicine, and education, and sending of their male household members to work, often-times as foot soldiers for AGEs (Mansfield 2010).

The resurgence of poppy production within these peripheral areas concomitant with an increasingly powerful, localized, and lethal insurgency has forced a shift in the security strategy in Afghanistan toward an increasingly militarized approach. In 2010, the U.S. Department of Defense revised its Rules of Engagement to allow for the targeted assassination of known drug-traffickers—a distinction formerly reserved only for top Taliban and Al Qaeda leadership. Later that year, despite the fuzzy legality of the move, 50 traffickers were added to the military’s “kill list” (Kerry 2010). The eradication of poppy has, however, become not only a military target; it has also become a political object intersecting problematically with key and contested questions of legitimacy of rule. At the local level, Sherzai’s legitimacy in Nangarhar from the standpoint of the state and Coalition allies was based to a large degree on his ability to achieve eradication. Oppositionally, the legitimacy of local insurgency groups in the estimation of communities in

Pachir Wa Agam and elsewhere was largely contingent on their ability to resist these eradication efforts and protect the livelihoods of local farmers.

This ambiguity with regard to opium is reflected—and further complicated—at the higher political levels. The control of the opium trade in Afghanistan (that produces 90% of the world’s illicit narcotics) has been an important political object of the U.S. Government since at least the 1970s (Eliot 1977). The eradication of opium cultivation in Afghanistan is a practical necessity toward the realization of this object and also as a litmus test with regard to political legitimacy and the success of the rule-of-law under the Afghan government. These two goals, however, may apparently run at cross-purposes. A classified communication from then Ambassador to the..., Gregory Schulte, in Vienna in September of 2008 describes the concern of top officials regarding a rumor that the Taliban was about to ban opium within its controlled territories. Antonio Costa, then Executive Director of the UNODC similarly feared that “the (Taliban’s) ban, if successful, would be a public relations coup for the Taliban and legitimize their status as a political power.” He and the Ambassador’s office indicated that they would take action in the event that such a ban did come to pass (it did not²³), but were not specific regarding what sort of action would be taken (Schulte 2008:1).

Opposition to eradication efforts amongst local communities has grown considerably over the past several years. While in 2008 local residents in Pachir Wa Agam barricaded the road and held off ANSF eradication teams, local resistance has become increasingly violent. During the Spring 2012 eradication campaign, for example, forty-eight people were killed and a further 47 injured despite the fact that the eradication teams intentionally avoided areas where the

²³ The rumor itself has been often cited but its basis is hard to substantiate, particularly as such a ban would undermine the Taliban’s key support base.

insurgency had a stronger foothold, including Pachir Wa Agam (Mansfield 2014). In the years since 2010, and as the insurgency has gained power in Pachir Wa Agam and the surrounding territories, opium production has boomed, with agricultural lands in many areas being converted almost entirely to poppy by 2014 (Mansfield 2014a). The most significant increase occurred between 2012-2013 growing seasons, where total cropped land in Nangarhar Province—but primarily in Pachir wa Agam, Chaparhar and Achin Districts—increased four-fold from 3,151 ha to 15,719 ha, levels that had not been seen since 2003 (Figure 7). Farmers who have resumed poppy production have reported an increase in their standard of living, that they are able to eat meat several times per week, send their children to school, and access medical care which they were not able to do without producing opium. Profits from poppy production have also allowed many farmers to put in tube wells, which have been used to irrigate other crops such as vegetables which could not otherwise be cultivated, to access health care and education services (Mansfield 2014)

As a key land use and economic resource, opium poppy emerges as a politicized social-ecological object. Along the ecological domain, it dominates the agricultural landscape as a primary land use, commonly mono-cropped across large areas producing particular sets of agroecological outcomes relating to diversity and, as a short-rotation annual, erosion and sedimentation. Along socio-political domains, it figures prominently not only as a key adaptive response of local communities to chronic poverty and insecurity, but also the primary source of financing for the insurgency, making its eradication a key object of state rule.

CONFLICT: SCALE, SPACE AND AGENCY

The foregoing analysis of the specific causal pathways through which armed conflict in Tora Bora and its surrounding landscape highlights the multidimensional role of power—that of politico-military apparatus of the state, armed insurgent groups and local communities—in shaping social-ecological outcomes. These observations prompt some reflection on how the timber trade and the production and trade of opium intersect with geopolitical processes and the application of resilience-based analyses of conflict environments. I organize these reflections around three thematic elements: the (inter-)scalar dimensions of power dynamics, space and spatial relations between state and marginal forces, and the problematization of agency.

Dynamic processes of conflict and change in the areas surrounding Tora Bora and Pachir Wa Agam are in some sense very local. The spatial distribution of change in forest resources, ranges, and settlements, tribal relations between the Khogyani and Shinwari, and the knock-on effects of antecedent events and political alliances are all emergent from local contextual factors. They are not, however, *only* local in either their origins or their impacts. In both the current conflict and that which occurred during the Soviet invasion, Tora Bora and the surrounding hills have figured prominently at the juncture of intersecting global forces, complicating the possibility of teasing apart local from non-local causal processes of social-ecological change. Forest and land use change are inextricably linked with socio-political processes that originate far distant from the sites of change themselves, emphasizing the significance of inter-scalar relations.

These interactive relations play out not only across scales, but also across space. “Space” according to Foucault (1984: 252), “is fundamental to the exercise of power.” Territorial claims and the policing of state space has always been a key feature in the project of state-making (Elden 2007). The governance of non-state spaces within marginal areas—and the risks of their

non-alignment with state interests—has become a key concern in state-based discourses of securitization (Chandler 2015).

In Pachir Wa Agam, a number of interventions have been foisted upon these marginal areas in an effort to solidify state control, foster obedience of the periphery to the center, and to allow aid programs greater access to remote communities. The establishment of CDCs to functionally replace the tribal Shura, increasingly militarized interventions into poppy production and the timber trade, the extension of ANSF and Coalition forward bases, and an extensive surveillance system of drones and informants may all be understood as technologies (*sensu* Foucault) of the state to govern these margins. In a very important sense, the legitimacy of these interventions rests on making the two-fold case that the system is ‘broken’ and that the most appropriate fix is greater state control. Demonstrating the erosion of local social institutions, economy, and environmental quality appears straightforward. Locating the causes of these erosions—and thus by implication the appropriate solutions—is much less so.

Environmental discourses are commonly framed in such a way as to lay the blame for degradation on the door of the local poor and, in so doing, provide the self-evident justification for intervention by government agencies and international organizations and militaries (Basset and Zueli 2003). In such narratives, these peripheries may be characterized either as “hopeless places” or spaces of emiseration in need of government intervention (see for example De Soysa et al. 1999) or, conversely, as the refuge of stateless and politically-marginalized peoples escaping and resisting the totalizing dominance of the state (Scott 2009; Menon 2010).

Historically, the Afghan state allowed a high degree of autonomy to the tribal areas along its remote margins (Rais 2008), a feature that has allowed for the persistence of traditional modes of governance and arguably fostered local resilience and stability in the governance of these

peripheral areas during periods in which the central state was imperiled by political and military instability (Lee 2007). Given these complexities, I cautiously highlight the historically-contingent nature of the state and its fixed territoriality (Agnew 1999) and suggest that renewed attention should be paid to marginal spaces and the complexities of center-periphery relations with regard to their role in social-ecological resilience. While firming-up national boundaries and the extension of the state into marginal frontier areas may foster resilience (such as through the regularization of rule-of-law) my research suggests that several traditional mechanisms fostering resilience in the Chaprahar Watershed—communal resource management and dispute resolution under the tribal Shura, customary norms of labor-sharing and transboundary trade and relational networks—were predicated on semi-autonomy from the state and the porosity of the border.

Resilience scholarship has thought of areas on margins of systems as sites of innovation and change (Brown 2013), with possible implications for the functioning of the system as a whole. This notion is quite suggestive. In the case here, these tribal spaces on the margins of state power exhibited particular kinds of social-ecological dynamics and were in one sense peripheral—as spaces of resistance to centralizing state power. But in their role as contested borders of the nation state, they were core to the strategy of achieving the geographical imaginings of the nation-state, and were in another sense quite central. Nowhere have these contestations and the complexities of center-periphery power dynamics become shriller than on the issue of opium poppy. On the one hand, the cultivation of poppy has served as a vital adaptive strategy for communities mired in persistent poverty, while on the other it has become increasingly a political and symbolic object of state rule and territorial (in)security. Effective suppression of poppy not only valorized the authority of Sherzai to U.S. and Coalition leadership, but it was

feared by these same officials, that a successful ban by the Taliban would similarly support their legitimacy as a potential alternative power.

This also points to the problematic—and typically overlooked—nature of agency. In the face of such opposition, the success of poppy farming and an increasingly local insurgency against the state and Coalition forces points to strong collective agency, even as it renders this agency problematic by dint of its association with subaltern violence and the global narcotics trade. Resilience is understood by many to be predicated on strong social agency (Coulthard 2012) even nearly synonymous with it (Pain and Levine 2012). This/My analysis calls for a renewed attention to the role of social agency as a foundation of resilience, even as it cautions against oversimplifying and, certainly, fetishizing it. Social expressions of resistance and agency in Tora Bora and its surrounding areas have had ripple effects throughout the world. In some sense, the failure of the Soviet Union to subdue these areas on margins of state power played an important symbolic role in the dissolution of the Union itself. To suggest a more controversial example: in that conflict and on these hills, two individuals—Osama bin Laden and al-Zarqawi—cut their teeth waging war against a superpower and began the birth pains of two politico-religious groups of global significance, Al Qaeda and the Islamic State.

CONCLUSION

At a very basic level, my analysis suggests that social and environmental dynamics under conflict are iterative and closely related; conflict and the breakdown in social relations are both product and cause of social-ecological degradation. Deforestation and land use changes within the watershed resulted directly from conflict—as, variously, resources for the insurgency and adaptive responses by local communities to chronic poverty and insecurity—and also prompted

and exacerbated conflict. A more expansive look at how these local processes are embedded within broader structural dynamics suggests further that governance arrangements and multi-scalar geopolitical forces loom large in shaping social-ecological outcomes within conflict complexes. Diverse and contested framings of security, state-building, and center-periphery relations between the central state and marginal communities are embodied in (not only) local social-ecological process and thus produce particular social-ecological outcomes. In this case, contestation surrounding territorially-embedded resources including timber values but, especially, opium poppy become politicised and thus become not only social-ecological concerns but also objects of state rule.

The activation of local social agency in this context intersects problematically within these contestations, highlighting the perspectival nature of what constitutes a desirable social-ecological system state as the needs and interests of local actors are pitted against those of state-makers and government authorities. Approaches to state-building under conditions of conflict must engage with the meanings and implications of center-periphery relations and areas marginal to state power, and the porosity of state boundaries. I suggest that these marginal and porous boundary areas may best be understood as dynamic spaces of articulation between complex processes that operate across scale and may serve as sites of innovation and adaptation. Clearly, more work remains to be done in elaborating social-ecological processes within other conflicts in different geographic settings, but we believe that this provides some grist for the mill as we advance a deeper understanding of change processes within social-ecological systems under conditions of conflict.

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CHAPTER 6: CONCLUSION

Addressing power, and interrogating its role within social-ecological processes, is essential to the analysis of complex systems. Without such interrogation of the overt manifestations of power as well as its less obvious—but certainly as significant—role in shaping social discourse, policies, and programs, our understanding of complex systems is not only limited and partial, it may also be simply wrong and may function to valorize the claims of the powerful at the expense of the less-powerful. In chapter 3 I intimated the need for a ‘political ecology of resilience’. In my view, this dissertation constitutes a credible attempt to advance this idea. Each chapter engages with the issue of power, its varied and interactive manifestations, and the impacts of these on the functioning of social-ecological systems in Lao PDR and Afghanistan. While each is different, it is possible to distill some common elements from the whole. In these concluding pages I will seek to draw out several core issues presented in Chapters 3-6, discuss additional implications of these for theorizing about power within social-ecological systems, and suggest some directions for future research. Some of these core issues relate to particular discourses that frame and communicate power and have materialized within policies and laws or functions to legitimize (not only) militarized interventions. While I have decomposed these issues into discrete sections for the purpose of discussion, they are largely overlapping and interactive.

ECOLOGICAL MODERNIZATION - A DISCOURSE OF POWER WITH MATERIAL IMPLICATIONS

In ecological modernization—wherein commitments to efficiency and technological innovation figure prominently, the environment is systematized through expert (typically Western,

scientific) categorization, zoning, planning, and functions to make government intervention in nature ‘natural’—has been a key ‘technology’ (*sensu* Foucault) used to expand governmentality into nature by casting the legitimacy of government intervention in the governance of natural systems as self-evident (Fletcher, 2010). It is my contention that the epistemological assumptions of ecological modernization underlie—and are often explicitly invoked in—the bulk of resilience scholarship (and, of course, dominant approaches to environmental management in general) and remain typically unanalyzed. In Chapters 4 on REDD+ in Xe Sap and 5 on the specialization of power in Xe Pian I sought to draw out these assumptions and to deal with them critically. In these cases, conservation managers did not apparently question whether the best hopes for nature were to be achieved through the cataloging of species, ecosystems and habitats; the expansion of governmental control into forested ecosystems; and the *in situ* displacement of local communities. What is especially perplexing—and what in fact constitutes the most pernicious aspect of ecological modernization—is that these conservationists (whom I know personally and, in some cases, very well) were very well-intentioned. The impoverishment of local people, the delegitimization of their place-claims or indigenous knowledge were not, of course, explicitly intended by environmental managers, but were nevertheless among the outcomes of environmental practice. In part, this is why analysis of the discourses that undergird our environmental paradigms—the explicit unraveling of their core assumptions and an attempt to follow the threads of these discourses to their potential environmental and social outcomes—is so essential.

There is a radical dimension to the critiques of ecological modernization, centering on its epistemological assumptions (more or less what has been called ‘the scientific worldview’). While, in my view, operable alternatives to the ecological modernist epistemology are somewhat

unconvincing (consider, for example, the difficulties of effectively operationalizing the sort of unbridled epistemological pluralism envisioned by Escobar 1998 or Kassam 2010) there are elements in these critiques that may provide a promising direction for future research. In the chapters, I do not spend much time on indigenous knowledge.²⁴ Throughout my research (and going back to before the PhD), two things have become increasingly apparent: (1) the depth and precision of environmental knowledge held by local participants and (2) there were some very important differences between their rationalities and my own. I am in the early stages of developing three papers (dealt with next in order): one dealing with the question of mobility in indigenous knowledge systems and two dealing with, and unpacking the implications of the social construction of nature.

Taking the critique of ecological modernization forward: *Research directions*

In forthcoming research, I want to explore the production of traditional environmental knowledge (as one counter-point to ecological modernization) under conditions of mobility. Theorists often emphasize the local-specific nature of traditional knowledge and non-transportability (e.g. Roth 2004, Kassam 2009). In fact, this is often pointed to as a key difference between indigenous knowledge and western scientific knowledge, which is viewed as generalized and ‘coarse-grained’ (where indigenous knowledge is viewed as fine-grained and rather local). This notion invites a bit of ‘poking at’.²⁵ Ethnic minority groups in Laos that depend on natural resources (such as the extraction of NTFPs) have often been highly mobile,

²⁴ It is worth noting in passing that the politicization of indigeneity also wields certain forms of power in post-modernity, and is bundled together with other powerful politicizations relating to space and territory, such as the various indigenous peoples movements, etc.

²⁵ The distinction between ‘western science’ and TEK is less firm than some have asserted. How western science gets translated into our bundled up within traditional knowledge systems—and vice versa—is worth exploring in this context alongside other social processes related to its production and invocation, and the claims of power that shape these.

both seasonally and inter-annually. This was perhaps most pronounced during the conflicts of the 1960s and 70s, wherein the majority of the population was displaced. That communities and individuals have been highly mobile and yet have acquired fine-tuned knowledge of their new environments seems to suggest that some forms of traditional environmental knowledge are in fact quite mobile. More interesting, perhaps—and what I particularly want to explore in the research—is whether it is the knowledge content that is important, or the traditional mechanisms of producing or transferring knowledge under conditions of mobility (or both/neither). The ability of these communities to be resilient in the face of mobility hinges on the speed and accuracy of their knowledge acquisition/production in a new environment. The application of this that might have particular traction would be to questions of climate-induced migrations and how we might better understand processes of knowledge production during (or following) these displacement events.

The second research project—that follows directly from the critique of ecological modernization coming out of the dissertation work—is engaging with a thorny issue in the practice of environmental management. While the social construction of nature is a core tenet of environmental sociology it has gained little traction among practitioners of environmental conservation (and most academics in the physical sciences). Ecological modernization (and neoliberal environmentality, below) entails a particular way of understanding nature and the self-evident relationships between social and ecological elements (i.e., it is a particular construction of nature). While unpacking the assumptions of this construction and exploring their implications and potential outcomes would be very useful to conservation managers, this is seldom done largely because the concept itself remains abstract and is not perceived as plausible or useful (preliminary data from field interviews carried out in 2015). Taking Dong Hua Sao NPA (the

first and only NPA in Laos to be proposed for degazettement and reclassification as a special economic zone) as an example, I will explore the implications of three particular constructions of nature—one based in an indigenous worldview of local communities (emphasizing the implications of an animistic understanding of nature), another on the ecological modernism of conservation organizations and state forest agencies (emphasizing functional materialism, nature as inherently valuable and to be protected), and that of developmentists (emphasizing nature as economic resource, also functionally materialist). The research will focus on how the implications of these social constructions came to the fore during the (unsuccessful) bid for degazettement.

The third project relates to the subjective and socially-constructed nature of forest classifications and the material implications of these constructions in the practice of forest governance. Framed thus, it sounds a bit pedestrian, but I think it is not. Laos has initiated the process of graduating from Least Developed Country (LDC) status by 2020. The terms of this process, overseen by the United Nations Development Program, involves Laos establishing and reaching several benchmarks relating to economic development, poverty eradication, governance, human rights, and environmental sustainability. A key benchmark indicator for the latter is that Laos will achieve 70% forest cover by 2020. Currently at 40.5% and declining by nearly 1% per year, it is virtually impossible that Laos can reach this target, thus jeopardizing its bid for graduation from LDC status. The Ministry of Natural Resources and Environment, however, has announced that it is revising the definition of ‘forest’. Currently defined as 20% closed canopy in a stand of trees more than 5 m high covering a minimum of 0.5 hectare, Laos is moving to change to FAO’s standardized definition of 10% closed canopy. It will also include rubber, teak, and eucalyptus plantations within this new forest definition. Once confirmed, this redefinition will allow Laos to

immediately achieve the 70% target. While in my position in UNDP I have strenuously opposed this redefinition insofar as it relates to the LDC graduation process, but it is likely that this will eventually pass. This political move would serve as the prompt for a paper that looks at how forest definitions and categorizations pass from their epistemological moment (where social actors sit down and think through the definitions and categories) to their ontological moment (the taken-for-granted stage) without notice. This analysis will extend beyond this one instance, exploring other forms of forest categorization (a typical manifestation of ecological modernism), looking Laos' state forest categories, gradation of forest ('stocked' versus 'unstocked'²⁶), down to and including pixel classification by GIS analysts and the practical, material implications of the various subjective and political dimensions of how these were created.

NEOLIBERAL ENVIRONMENTALITY—SELLING NATURE TO SAVE IT²⁷

Neoliberal environmentality is another key discourse that shows up directly in two papers (discussed below) dealing with the REDD+ projects in Xe Sap (Chapter 4) and in Xe Pian NPA (Chapter 5). Neoliberal environmentality builds upon ecological modernization, but makes an important distinction by specifying that it is not the state (to the failings of which is attributed ecological degradation), but the neoliberal market structure (cast as the appropriate solution to the failings of the state) that is the most appropriate mechanism for the regulation of 'modern nature' (Oels 2005). Such neoliberal government of nature requires the privatization of common

²⁶ Laos' state forest management has historically identified two large categories of forest: stocked (having large diameter trees of significance and a higher degree of closed canopy and vertical structure) and unstocked (a degraded forest system with poor structure and connectivity, with low timber values). Stocked forests fall under the administration of the Department of Forestry and are subject to a particular set of regulations. In particular, stocked forests cannot be cleared for plantations or other economic concessions. The economic implications of this intersect with the large degree of subjectivity involved in determining stocked versus unstocked, making this a prime example of how science intersects with other social endeavors.

²⁷ McAfee (1999)

property resources (often legitimized through Hardin's [1968] deeply ideological narrative of the 'tragedy of the commons'), the commodification of nature (to allow it to be regulated through market instruments; Hajer 1997) and the withdrawal of the state from direct market transactions. This is done, however, while fundamentally depending on the state to ensure the market by accomplishing privatization and commodification (Fletcher 2010) and curbing the 'destructive tendencies' of inappropriate market dynamics (Eckersley 2004).

While the ideological commitments of environmentality have proven formative in the dominant narratives of global environmental policy and programming, a number of political ecologists, 'post-development' practitioners, activists, and not a small number of indigenous people's movements have criticized both its assumptions and its practical and material outcomes. Prominent among these critiques include the disadvantaged position of poor communities to compete in increasingly globalized neoliberal markets (Okereke 2006) and the potential for accelerated ecological degradation driven by new market demands for commodified products. Also, the potentially far-reaching impacts of social transformations concomitant with shifts from communal traditions of governance and norms of sharing toward privatization and individualized behaviors and the simplification of agroecological systems (Davidson 2010) in ways which decouple indigenous knowledge and livelihood systems from their resource base (Broden and Greenberg 2005)—all of which function to erode the resilience of these social-ecological systems (Xu et al. 2009). Neoliberalism, it may be said, is a political project that creates the realities that it says already exist (Lemke 2002) by driving social changes through which the poor are increasingly marginalized (Menon 2010) and the resources of the poor are increasingly expropriated, accruing to the benefit of the more powerful. Under neoliberalism, assert McCarthy and Prudham (2004), "profoundly political and ideological projects masquerade as a

set of objective, natural and technocratic truisms” wherein “what is cast as an ‘environmental problem’ is in the end primarily a problem of the political economy” (Foster 2009). The idea of the separation between the apparatuses and powers of state and free, unpoliticized markets has proven to be something of a utopian illusion within the real-world operations of government. The economy, in short, is always a political economy (Lemke 2002).

Resilience scholarship has not tended in general to take the leap from ecological modernization into neoliberal environmentality, but there is reason to anticipate that it will, given the broad areas of shared epistemological commitments. Resilience, by way of its incognizance of power, lends itself unproblematically to the power-filled paradigms of ecological modernization (above) and global neoliberal governmentality (Okereke and Dooley 2010). Resilience thinking further ‘sets itself up’ for its co-option by neoliberal forms of environmentality by its tendency to adopt simplifying ontological assumptions of social actors as largely non-agential and certainly ‘rational,’ possibly for the purpose of making humans legible to its predictive and deterministic models (McLaughlin and Dietz 2008). Cumming (2011), for instance, summarizes that resilience in social systems will depend upon the ability of institutions to create incentives to encourage appropriate environmental behaviors—an approach characteristic of neoliberal environmentality.

I engage most directly with neoliberal environmentality in my analyses of the REDD projects in Xe Sap (Ch. 4) and Xe Pian NPAs (Ch. 5). REDD, likely the most globally significant example of a payment for ecosystem services (PES) scheme is an archetypical technology (*sensu* Foucault) of neoliberal environmentality. It seeks to mitigate global climate change by using a market-based mechanism through which payments can be used to incentivize the avoidance of deforestation and forest degradation. This requires that a commodity value be assigned to

standing forest biomass, this biomass be quantified, ‘ownership’ claims be clarified, and a system for assuring the permanence of any avoided deforestation. Intuitively, this is a very attractive option for mitigating global climate change while recognizing the ‘development rights’ of forested nations and people (one of the sticking points in international climate negotiations has been the argument that poorer nations should be entitled to the same development rights (with the associated GHG emissions) as richer countries, who share a larger proportion of the blame for climate change). In both chapters, I problematize this by focusing on the implications of the assumptions of REDD and how it has played out in practice in these protected areas. The analyses are, however, framed differently.

In Xe Sap (Ch. 4), I framed my analysis around the notion that forest conservation through REDD may not only support climate mitigation, but will also deliver climate adaptation benefits for forest-dependent communities (I also deal with this under the section win-win and trade-offs, below) using social-ecological resilience as an analytic lens. From this analysis, one of the key critiques of REDD as a neoliberal mode of environmental governance centers on how the commodification of forest carbon intersected problematically with existing forest uses (particularly shifting cultivation), risked recentralizing forest governance by creating new monetary incentives for state managers to regulate previously unregulated forest spaces and, by privileging certain environmental values, risked undermining the historical disturbance regimes that played a key role in creating structural heterogeneity and biodiversity.

In Xe Pian NPA (Ch. 5), which now hosts the first verified REDD project in Laos, analysis included some reflection on the elements of the research in Xe Sap above, but focused attention more specifically on what I consider to be a deep structural problem with neoliberalism in general, the issue of antecedent conditions. Like any project of governance, REDD maps out

onto spaces that have been shaped by policies and programs, market conditions and numerous other social realities, all of which are shot through with asymmetrical power relations. As such, REDD is itself shaped by these antecedent realities as it is applied in practice. In the case of Xe Pian, REDD was applied rather unproblematically within a National Protected Area where it took for granted the erasure of indigenous territorial claims of communities resident within the NPA. That the NPA was legally considered the property of ‘the people of Laos’ on whose behalf it is managed by the state forestry agency proved efficient for the developers of the REDD project, reducing transaction costs (as the state, rather than local communities, serves as the *de facto* ‘owner’ of the carbon) and legitimizing the criminalization of local livelihood practices in an effort to curb deforestation.

Taking the critique of neoliberal environmentality forward: *Research directions*

Future research directions may include a broader, multi-country critique of REDD in practice. In addition to the two chapters in the PhD work, I have also co-authored a CIFOR publication on REDD+ in Laos (Dwyer and Ingalls, 2015). My sense is that future research should focus at a larger geographic level. I may lead a team this coming year to establish the structural and institutional conditions for a national REDD program in Laos. Should this happen, it would be particularly interesting to link with other national REDD projects in several forested nations and develop a research paper scanning across the practical application of REDD as a project of governmentality (or a similar framing). In my view, many of the problems associated with neoliberal environmentality manifest themselves when they intersect with trade-off decisions in projects of environmental governance, to which I now turn.

CHALLENGING THE LANGUAGE OF WIN-WIN

While I do not view this as one of its central concepts, neoliberal environmentalism nevertheless tends to emphasize the ancillary benefits of conservation interventions for local livelihoods, economic development, etc. Framing market-based mechanisms for securing select environmental values as a win-win for people and nature, these approaches have gained significant political traction. As (not only) my research illustrates, there are reasons to be cautious. In the language of win-win, complex political realities are elided and key drivers of change are often ignored or not engaged with (Hirsch et al. 2011). Within social systems, for instance, there will always be winners and losers from environmental governance in general and during periods of system change in particular where interests of some actors are privileged over the interests of others. This raises social and normative questions of legitimacy on the one hand (Brown et al. 2013) and ecological and technical questions regarding the differential costs and benefits accruing to social versus ecological system components on the other. While dynamics of power and questions of deliberative and distributive justice operative within trade-off decisions must address the persistent social problems associated with the relative scarcity which characterizes current global resource dynamics, global environmental changes threaten to exacerbate these issues by presenting new challenges with regard to increasing global scarcity in absolute terms (Davidson 2013) as systems are driven toward conditions of environmental criticality that are unable to provide for all (Kasperson et al. 1996). All of this of course prompts the fundamental question ‘resilience for whom?’ (Lebel et al. 2006). My sense is that throughout much of resilience scholarship, this question lies largely in the background (if anywhere).

I highlight a move toward trade-offs in projects of environmental governance most explicitly in the Xe Sap research (Ch. 4), problematizing the language of win-win that has infused the REDD

debate. Bringing together mitigation and adaptation through comprehensive, joint policies and programs seems sensible, it has been quite difficult to operationalize in practice. REDD, primarily focused on mitigating climate change by conserving standing forest biomass, has also been touted as a way to achieve numerous ancillary non-carbon benefits including improved production and delivery of ecosystem services (water and microclimate regulation, biodiversity, provision of forest products for local use, etc.) and, through these, the enhanced adaptive capacity of social-ecological systems to climate change. This argument is intuitive and has been influential in securing traction for REDD in the Developing World where climate mitigation has less political support, given the urgency of adaptation needs (Guariguata et al. 2008). My research in Xe Sap focuses on these assumed synergies under REDD by taking this out of the realm of theory and into the practical outworkings of REDD on-the-ground, using resilience as an analytical lens. The research highlights the problematic ways in which REDD entails trade-off decisions between carbon values and numerous elements—local livelihoods, biodiversity values, local versus structural drivers of forest change, and decentralized forest governance—but elides these through narratives that emphasize win-win.

While in the other empirical chapters, this issue of trade-offs is implicit rather than a central focus of the analysis, each contribute to this core issue of how structures of power typically privilege the interests of certain segments of society at the expense of others, but that this trade-off is hidden by legitimizing discourses. Further—and this gets at the thrust of my power-based critique of resilience—these legitimizing discourses are generally either supported by resilience scholarship or ignored by it. Undertaking closer, more critical and power-conscious analyses of trade-offs within social-ecological systems studies is all the more necessary as climate-weirding

continues and the precise nature and knock-on effects of these trade-offs become more difficult to see.

THE SECURITY EXCEPTION IN ENVIRONMENTAL GOVERNANCE

Exceptional modes of governance wherein normal legal processes or social safeguards are shunted aside in cases that are deemed (typically by those in power) ‘exceptional’ is common in the practice of government, certain forms of this exceptionalism have received increased attention in recent years. My research highlights this explicitly in *Xe Pian* (Ch. 5) dealing wherein we see the entwining of discourses on environmental security invoked to legitimize extralegal management interventions, including the enclosure of new areas at the discretion of protected area managers, rigorous management provisions that criminalize certain livelihood practices without a relevant legal mandate, etc. This exceptionalism is also implicit in the Afghanistan research. America’s mode of intervention in Afghanistan typifies an ‘exceptional case’ approach that is legitimized by the discourse of (in)security.²⁸ The remote, peripheral spaces along the Afghan-Pakistani border, in these discourses, are threats to the national security of Afghanistan and, by extension, the United States Rectifying this insecurity involves interventions to discipline these spaces and render them subject to centralized state rule. These measures include actions—military assassinations of opium traders, destruction of crops, etc.—that would be criminal in normal (non-exceptional) contexts.

Taking security-exceptional research forward

In a previous paper published in *GeoForum* last year (Dwyer et al. 2015), colleagues and I explored how discourses of state security have become intertwined with narratives of economic

²⁸ *Silent enim leges inter arma* (in times of war, the law falls silent)- Marcus Tullius Cicero

security surrounding the issue of illegal timber trade in Xe Pian and Nam Phouy NPAs. These security risks served as the basis for Prime Ministerial Decree 111, authorizing the militarization and economic exploitation of peripheral forest areas (this issue shows up in my Xe Pian work, though I take it in a different direction). This, and my analysis of the invocation of environmental security to justify exceptional NPA governance, strikes me as a very promising direction for future research. In particular, discourses of global environmental change often invoke the risks of environmental change (such as water scarcity, food insecurity, migration events, etc.) prompting military and other social conflicts. Whether, or in what cases, these narratives may be trotted out to justify exceptional or extralegal interventions, and how these intersect with social-ecological outcomes might be of particular interest and allow for a better understanding of how this expression of power shapes resilience (it may be especially fun to problematize this; might security exceptional governance enable the sort of political agility needed to ensure resilience in contexts otherwise enmired in bureaucratic sloth?).

PERIPHERAL SPACES AND THE CENTRALIZING STATE

Peripheries and the margins of state space (*sensu* stability domain) are understood to play an important role in the functioning of social-ecological systems as areas that are stressed (being toward the extremity of the stability domain) and potential sites of change and innovation. While my sense is that many resilience theorists have not generally envisioned the application of these observations to geographic peripheries, my sense is that the notion applies (though the extension might be rather metaphorical). I sought to draw this out in my treatment of peripheral geographies in Afghanistan, Xe Sap, and Xe Pian.

In Afghanistan (Ch. 6), spaces at the margins of national territories manifest as sites liberated from centralized state control (albeit subject to other forms of power). Contested, overlapping and complex powers characterize the insurgency in these spaces, enabled by the porosity of the border, local tribalism, and a (social and topographical) terrain very difficult for the state military to negotiate. These insecurities have played a significant role in environmental outcomes including rapid deforestation, rangeland degradation, and reductions in water quality. But these spaces have also given rise to other social-ecological processes. The lack of governmentalizing reach into the mountainous areas along the Pakistani border allowed for the emergence of broad-scale agricultural conversion to poppy and a burgeoning and lucrative trade in opium, the benefits of which have had measureable, positive impacts on local well-being. State-led efforts to eradicate opium poppy and to disrupt the opium trade have pitted the interests of state authorities against those of local communities, who have increasingly turned to support the anti-government insurgency.

Resistance fighting against the Soviet invasion in the late-1970s and 80s and the U.S. invasion in 2001 gave rise to two important global politico-religious movements, specifically Al Qaeda and ISIS. These marginal areas thus became the sites of two very important global phenomena whose activities have (perhaps arguably) come to play a highly influential role in contemporary geopolitics (consider ISIS in Syria, but also the knock-on effects related to the massive migration movements into Europe and the series of far-right political movements that are forming in Europe and elsewhere, partly as a direct response to this). In light of all this, we see how peripheral spaces—and, indeed, peripheral peoples—have come to threaten, depose, and reinvent the center. This risk is not unknown. The legal implications of U.S. involvement in Afghanistan and Pakistan vis-à-vis the UN Charter, Article 51 of Chapter VII: “Action with respect to the

threats to the peace, breaches of the peace, and acts of aggression” authorizes a defending state to take military action to protect itself. Normally, this article is understood to relate to the use of force by one territorial state against another territorial state that poses a direct threat. Following September 11th, however, the provisions of this article were interpreted in a very different way by the U.S. and its allies to authorize the use of military force against non-state actors operating within the territorial boundaries of another nation. Several rulings by the International Court of Justice have established precedent for self-defensive military action against non-state actors operating within ‘unregulated territories’ of another nation state and/or in cases where that national state was proven ‘unable or unwilling’ to mitigate the threats posed by non-state actors operating within its territorial boundaries. This precedent served as the legal basis for the U.S. invasion of Afghanistan and U.S. military operations in Pakistan against Al Qaeda, though the legality of the latter has been very much contested (see Ebben 2011). This is all very interesting with regard to how we understand power and its operations within areas peripheral to state control which, in light of these provisions under the UN Charter, become areas “up for grabs” whenever they are deemed to pose a threat to state control.

In *Xe Sap* (ch 4), peripheral forests emerged as the refuge of resource dependent communities whose livelihoods—criminalized by legal prohibitions on shifting cultivation within the NPA—were ensured in these places in the absence of state forestry agencies. The persistence of these subaltern livelihood strategies created particular sets of disturbance regimes²⁹ with identifiable ecological implications for biodiversity and structural heterogeneity. The commodification of forest carbon poses a risk of incentivizing the active control of these state agencies, the cessation of shifting cultivation, and the recentralization of forest governance more generally. That this

²⁹ Generally, shifting cultivation in upland areas (this is covered in detail in Ingalls and Dwyer 2016).

reterritorialization of Xe Sap was prompted by the global carbon market and promoted by international conservation organizations adds an additional scalar-level to this center-periphery dynamic.

In Xe Pian (ch 5), we see something else happening, which reflects both of these cases in some sense, but is also quite different. Similar to the cases above, the remoteness of Xe Pian made it a refuge from power. During Laos' civil war political dissidents and revolutionary militants escaped to the deep forests of Xe Pian because they were inaccessible to state military. In the late-1980s these spaces again became the refuge of Khmer Rouge fighters fleeing the Vietnamese takeover of Phnom Penh. But here is where the case takes a different turn. The historical role these peripheral forests played in succoring political dissidents legitimized state military claims that these spaces presented a security risk, resulting in Prime Minister Decree 111, reterritorializing the forests and its resources. The periphery was thus claimed by one element of the central state's power, to the exclusion of other state agencies on a legally-questionable basis. In some sense, this periphery became a refuge of state power from the rule of law. But these processes along Xe Pian's border reflected also something else: the historical contingency of the center-periphery distinction and the persistence of antecedent structures of power. Transboundary politico-military alliances deriving from shared lineage and history of ruling families predating contemporary national distinctions played an important role in the movement of high-value rosewood between Champasak Province and Cambodia. This problematizes the notion of center-periphery by highlighting its historically contingent nature. What had been a center of power prior to French colonialism was rendered into a two, mirrored peripheries divided by the international Lao-Cambodian border.

There are other ways of understanding peripheries and their role in the functioning of social-ecological systems. The idea of periphery almost certainly invokes or implies boundaries. In the examples from the research chapters in this volume—especially those dealing with Afghanistan and Xe Pian, but also Xe Sap and an earlier publication not included (Dwyer et al. 2015)—the focus is on international boundaries. In my research I sought to problematize (perhaps implicitly) the conventional idea of a boundary as an obstacle, or a wall. Especially in areas of limited access (e.g., the Spin Ghar mountains in Afghanistan and the largely forested spaces of Xe Pian) where central state control has been very limited, these boundaries are better understood as moments of articulation and interaction in the flows of people and resources (among others). That these borders are spaces of intense activity in these flows was of course a particular concern of the state-makers in Afghanistan (see, for example John Kerry's [2009] repeated statements regarding the national security threat that porous Afghan borders posed to the state). Seen from the other side, these spaces of interaction and exchange were very important in the movement of subaltern people between the state spaces of Afghanistan and Pakistan not only in seeking refuge from conflict and access to markets. This porosity, as I note in the paper, was an asset to U.S. interests during the Mujahideen period for the same reasons that it became a liability in contemporary times.

In an increasingly globalized world it does, however, become difficult to speak unproblematically of centers and peripheries. The compression of space-time and the accelerating flows of people, information and materials entail a reformulation in the way we think of space. It also complicates a central notion of resilience scholarship regarding the importance of self-organization in systems. That is, the systems that are organized by internal processes are more resilient to change than systems that are externally-driven and will be more

robust to change given its internal capacities for reorganization and regulation. The easiest intuitive example is an agroecosystem in which systems where predator-prey population dynamics are driven largely by internal processes rather than pesticide regimes, or where nutrient cycling depends primarily on the decomposition of plant residues and other vegetative matter rather than the application of fertilizers. When we begin to look critically at center-periphery relations in light of globalization and other forms of interconnectedness, the analysis becomes quite complex to the point where these conventional specializations almost disappear. Returning again to the simple illustration of the agroecosystem, even where it fulfills the self-organized conditions I mentioned, it is continually interacting with other systems at various scales. Predator-prey relations depend as much on processes of in-migration and outflows of both prey and predators as on 'internal' regulation, nutrient cycles depend as much on atmospheric deposition and nutrient flows from outside of the system as from internal processes.

Center-periphery studies: *Future research directions*

These observations, and the various conceptual, analytical, and political implications of center-periphery dynamics suggest a number of possible future research directions. Alongside this, and with regard to the sorts of internal motivation that prompt, inspire, and give dynamism to our research, there is a further significance I give to this topic. Gaytri Menon (2010: 163) noted that the "very survival" of the powerless "depends on working the boundaries." I think this is an important observation, and one that generally holds. It is often at the boundaries of centripetal power that we see the emergence of subalternity, where space is opened not only for refuge, but also for dissent. Because of the threat these peripheries may pose to the centers of power, these spaces have increasingly become framed in the language of (in)security and risk. These observations by themselves are not especially new (Scott's 2009 treatment in the *Art of not being*

governed a well-known case-in-point), but the application of these ideas to social-ecological system processes is generally underdeveloped. My three empirical chapters, plus Dwyer et al. (2015), all provided new empirical and conceptual material relevant to this, but further applications are needed. One particular example, and one that I anticipate will form the foundation for a future research project (with Rich Stedman), entails a critical re-examination of resilience scholarship's notion of self-organization and how it might set itself up against increasing integration and globalization. The concept of self-organization feels intuitive, but when it comes to pinning it down to particular systems, the complexities and exceptions to the rule quickly overwhelm the coherence of its logic, casting doubt on the operability of the concept itself.

HEGEMONY AND AGENCY AND THE DIFFUSION OF POWER

Previous sections, and much of my research, have (appropriately, I think) emphasized the marginalization of subaltern peoples and their social-ecological spaces within the asymmetries of power. This emphasis in some sense gives the impression that institutions of power—coalescing (not only) in the state, powerful international organizations, and neoliberal markets—are functionally hegemonic. Because power is diffuse, overlapping, and (re)produced throughout society it can never be limited to the state apparatus or other institutions. That power infuses social relations at all levels implies that there is always space for agency. Foucault's observations regarding the theoretical impossibility of hegemony and the always-opportunity for subaltern agency is, I think, insightful. He writes: “no matter how terrifying a given system may be, there always remain the possibilities of resistance, disobedience and oppositional groups” (1984: 245). While agency and subaltern contestation of power was not particularly the focus of my research

in Xe Sap (Ch. 4), it was given greater play in Xe Pian (Ch. 5) and constituted a central concern in Afghanistan (Ch.6).

In Xe Pian, local resistance to reterritorialization by military forces was significant, manifest not only in their verbal opposition, but also demonstrated by their persistent involvement in logging despite numerous arrests. In this chapter, I under-emphasized this opposition somewhat due to my concern for the security of research participants and, also, my own ability to maintain an active involvement in Laos. While I gathered evidence of several arrests throughout the NPA, I did include one of these in the chapter (though I redacted the name of the village). Similarly, vocal opposition to the militarization of the NPA was expressed not only by local communities, but also by forestry officials as reported in the chapter. Further, more substantive opposition was also expressed by the chief of one village who insisted that he and other members of the village were prepared to stage armed revolt if the government would not rectify the problem. Of course, I did not report this for reasons already stated. These oppositions, however, highlighted the agency of local communities despite significant countervailing pressure from the military. It also highlighted one further nuance in how power is expressed in these contestations over social-ecological spaces: that contestation is not only between institutions of power and subaltern peoples, but also within institutions themselves. While in one sense the Xe Pian case suggests opposition between the Government of Laos and the communities of the NPA, a closer analysis showed that the fragmented, conflictual and contested nature of the Government itself, with military interests coming into direct opposition to state forestry agencies. This is especially significant, I think, given the common perception of Laos—a Communist, single-party state ruled by a highly authoritarian and notoriously secretive government—as a system in which government agencies walk in lock-step with Party policies. These internal power negotiations

and inconsistencies within the state institution are clearly manifest in the verbal statements made by government officials who participated in the research, as reported in the chapter.

The agency of local communities on the margins of state power, as I have said, became a central focus of my research in Afghanistan. I brushed against this above in the section dealing with periphery-center relations, but it is worth drilling down here with specific reference to how this case demonstrates significant subaltern resistance to near-hegemonic military power, and also suggests some important dynamics of agency. The area selected for my research along the Afghan-Pakistani border was the site of two important military events in recent decades, both as one of the key centers of Mujahideen resistance to the Soviet invasion in the 1980s and again as Osama bin Laden's last stronghold against U.S. and Coalition forces in 2001. In this remote section of the Spin Ghar the greatest military powers the world has ever seen were unable to suppress a small resistance movement. In some sense, then, this was a very startling example of local agency.

But this case also illustrates several complex dynamics. First, local fighters drew on substantial support from powerful global allies, suggesting that local agency is not always (or ever) entirely local. The Mujahideen's success against the Soviets was due in no small part to support from the CIA. Similarly, the more recent resistance movement that started in 2001 has drawn support from diverse and conflicting sources including wealthy Arab families, organized crime networks operating from Pakistan and, though difficult to prove, Pakistan's Inter-Services Intelligence agency (ISI). Local communities in this context have served as both sponsors and participants in this resistance, and sometimes "merely" as hosts of it. Participants in the research were both active participants in the conflict and social actors living in a space recipient of significant external pressures stemming from global geopolitical contests far removed. At the start of my

research in Afghanistan in 2010, field access to the upper reaches of the focal catchment was limited and risky, but by the end of 2013 anti-government groups firmly held the area and no access was possible. As antigovernment opposition and local tribal resistance gained ground from the retreating Afghan National Army following the withdrawal of U.S. troops, local farmers beleaguered by persistent poverty could once again resume the most lucrative crops available to them: opium poppy and marijuana. By 2015, arable land within the research area had almost been entirely mono-cropped in poppy (Ch. 6). As I seek to illustrate in that chapter, this represents not only a massive agroecological transition but also, and taken together with the increasingly successful and localized nature of the insurgency, a complex expression of local social agency. I think it is an accurate generalization that studies of unequal power relations during conflict, and along the society-nature nexus more generally, tend to cast local communities as relatively passive or, where agency is demonstrated, tends to valorize agential local action against repressive politico-military structure as ‘good’ (see for example Bassett and Zueli 2003, Brogden and Greenberg 2005). Local agency in this context intersects problematically not only with the state-building project of the United States and the ruling elite in Kabul, but also with international efforts to combat the illegal trade in narcotics and other illicit substances. In my view, this analysis is one of the key contributions of the Afghanistan research to our understanding of conflict processes and illustrates Brogden and Greenberg’s (2005: 45) observation that the narratives surrounding contestation often mask the fact that “these disputes are actually competing claims between interest groups rather than clear moral imperatives.”

This line of inquiry regarding hegemony and structure-agency contestation within social-ecological systems in general and under conditions of (not only) armed conflict in particular is a

cross-cutting theme throughout my research and thus further research in this area is reflected in part in sections above. Research specifically relating to armed conflict, or the legacies of armed conflict, in social-ecological system functioning is a particular niche I have begun to develop and intend to pursue. I am in the initial stages of developing a potential research project focusing on the conflict in Mindanao in the Philippines, where I have met (2015) with representatives of the UN (who are potentially interested in hosting the research) and the representatives of the national-level Department of Environment and Natural Resources (DENR). A key feature of interest in this conflict from my perspective is the role of Malaysia—which has substantial mining and other interests in Mindanao—which has offered to serve as broker in conflict negotiations between the government and the insurgency. This move is seen by some as a bid to expand natural-resource sector access for Malaysian businesses, suggesting the relevance of interscalar power relations within an otherwise local conflict.

IN CLOSING: ADVANCING A POLITICAL ECOLOGY OF RESILIENCE

By way of concluding my conclusion (if you will), let me very briefly return to the overall contention of my research: Social-ecological systems—and the research practice of those who studying them—are simply shot through with asymmetrical power relations. These relations of power play not only a key role in producing the social and ecological outcomes of complex systems, but also in how these systems are framed and analyzed by resilience scholars, producing particular kinds of analyses materializing in particular kinds of prescriptions for (not only) management and policy. These dynamics are nevertheless largely overlooked within resilience scholarship. Absent of a critical analysis of this power problematic, our understanding of complex systems is not only limited and partial, it may also be simply wrong and may function to valorize the claims of the powerful at the expense of the less-powerful. This is why a political

ecology of resilience is so essential, particularly given the broad reach of resilience thinking across the world. In my view, these papers comprise a credible start in building the architecture of this critical endeavor. But, of course, much remains to be done, particularly in the direction of moving beyond critique to advancing approaches to social-ecological systems scholarship that incorporate the insights of critical theory to produce the kinds of liberating counter-narratives that are so urgently needed.

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