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**Article (Accepted version)  
(Refereed)**

**Original citation:**

Ingalls, Micah L. and Mansfield, David (2017) *Resilience at the periphery: insurgency, agency and social-ecological change under armed conflict*. [Geoforum](#), 84. pp. 126-137. ISSN 0016-7185

DOI: [10.1016/j.geoforum.2017.06.012](https://doi.org/10.1016/j.geoforum.2017.06.012)

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# Resilience at the periphery: Insurgency, agency and social-ecological change under armed conflict.

Micah L. Ingalls<sup>1</sup> and David Mansfield<sup>2</sup>

## Abstract

*Armed conflict has played an increasingly important role in the transformation of key social and environmental systems at multiple spatial and temporal scales. Accelerated resource flows and environmental change dynamics intersect with conflict processes in ways that are substantial and yet inadequately understood. Drawing on research along the Pakistani border in eastern Afghanistan's embattled province of Nangarhar, we employ a coupled systems approach for understanding the ways in which social-ecological processes shape and are shaped by armed conflict. Based on field surveys, geospatial analysis of land and forest change, and participatory research among local communities, government agencies and military actors, we identify several causal processes linking conflict and dynamics of social-ecological change in the context of multiscalar geopolitical processes. We focus attention on four inter-related elements: (1) transitional modes of resource governance relating to armed militia groups and state intervention, (2) forest changes related to illegal logging and trade networks, (3) the erosion of upper-montane rangelands through encroachment and changing pastoral responses to conflict, and (4) significant land use changes in the agricultural sector toward the cultivation of opium poppy. Our research highlights the importance of center-periphery relations, the problematic nature of local agency, and the ways in which local social-ecological elements—here, particularly, timber and opium—become political objects within competing narratives of (in)security and ongoing state formation.*

## Highlights

- We employ a resilience-based approach to analyze change under armed conflict
- Positive conflict-environment feedbacks drive system change toward threshold
- State margins and porous boundaries serve as sites of innovation and local resilience
- Opium and timber extraction emerge as politically-charged social-ecological objects
- Agency enables resilience, intersecting problematically with narcotics and insurgency

## Acknowledgements

We want to thank the people of Nangarhar Province, too numerous to name, who participated in this research. This paper benefitted from critical review provided by Richard Stedman, Thor Hanson and three anonymous reviewers, whom we would like to thank. Research was funded in part by the National Science Foundation, to whom we express our appreciation. This work is dedicated to our late friend and colleague, Dr. Linda Norgrove, whose efforts contributed to this work; you remain in our hearts.

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## 1. Introduction

Armed conflict has played an increasingly important role in the transformation of key social and environmental systems at multiple spatial and temporal scales. While comprehensive analyses of the social and political impacts of armed conflict are well-articulated, the ecological impacts of conflict as well as the interrelationship between these and social dimensions have also been an area of emerging research in recent years (Machlis and Hanson 2011). Conflict figures prominently both as a major underlying cause of forest-loss globally (Geist and Lambin 2002), and a key structural driver relating to land use, food production, insecurity and resource scarcity (Humphreys 2005). Deforestation may also be caused, variously, by forest resource extraction and the occupation of forest areas by armed groups (Hatton et al. 2001; Hecht and Saatchi 2007) or in some cases the intentional use of chemical defoliants by state militaries as a strategy to combat insurgency as seen, for example, in Vietnam (Westing 1983), Colombia (Messina and Delamater 2006) and Turkey (Van Etten et al. 2008). Agriculture and land use changes may be brought about through the abandonment of agricultural land in conflict areas (e.g. Suthaker and Bui 2008) with, in some cases, a concomitant expansion of agricultural land use in areas receiving conflict refugees (Witmer 2008) or those that support insurgent forces (Sanchez-Cuervo and Aide 2013). Other research has focused on the impacts of conflict on specific elements of biodiversity. Douglas and Alie (2014) explore the significant impacts of war on key species and the role that wildlife trade plays in supporting violence while Gaynor and others (2016) in a comprehensive study covering 144 cases globally, focus on the enabling conditions created by conflict and violence that produce negative outcomes of wildlife and biodiversity, emphasizing the erosion of social institutions and economic incentive structures as key causal pathways. Natural resource- and environment-change are also more generally implicated in the emergence and persistence of conflict in complex ways (Percival and Homer-Dixon 1998; Fearon and Laitin 2003; Collier and Hoeffler 2004; Rustad et al. 2008; Brunnschweiler and Bulte 2009; Klare 2011; Le Billon 2015).

Scholarship circulating around these questions has begun to build toward a more systematic treatment of social and ecological change in conflict environments. Machlis and others (2011) proposed the development of a subfield of ecology, warfare ecology, to focus attention on the particularistic ways in which armed conflict—with its enhanced flows of resources and energy, and patterns of intense and deliberate destruction—shapes environmental outcomes. Amid these advances, there remains a critical need for building a conceptual and analytic framework that brings together research on the relations between social and environmental change under conditions of armed conflict to enhance our understanding of causal impact pathways and, perhaps especially, yield insights relevant for understanding elements and processes foundational for post-conflict futures. Social-ecological resilience scholarship advances a particularly promising analytic framework for addressing this need in that it conjoins social and ecological elements in a larger, complex system structure and focuses attention specifically on the ways in which these complex social-ecological systems negotiate change processes and respond to disturbance. While resilience research comprises of a broad range of conceptual elements we will selectively highlight four aspects. 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—for example, communities, resources, and boundaries—play an important role in enabling or constraining adaptive response to change (Cumming 2011; Ingalls and Dwyer 2016, Ingalls *forthcoming*). 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 2016). 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 analysis, it has had limited application within the context of active armed conflict (Tidball 2014; Ingalls *forthcoming*; though see Ratner et al. 2013). A

resilience-based approach for understanding social-ecological dynamics in violent environments is yet to be fully elaborated and may be particularly important not only for understanding social-ecological change during conflict but also conditions shaping post-conflict recovery.

In this paper we interrogate social-ecological change within the context of the ongoing conflict in Afghanistan through the analytic lens of the resilience framework focusing on causal pathways of social-ecological change under armed conflict and conditions that foster resilience during conflict and may indicate potentials for a post-conflict future. Since the onset of the most recent conflict in 2001 more than 117,000 deaths have occurred as a direct result of the fighting (Crawford 2015; UNAMA 2016; GPI 2017). In 2016, military spending constituted nearly 16% of GDP while the economic impacts of war more generally totaled 45% of GDP (GPI 2017). Through this prolonged period of conflict several dynamics predominate. Endemic poverty within 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 a substantial conversion of agricultural areas to opium poppy and the emergence of a robust, if problematic, narcotics trade (Mansfield 2014a). The erosion of the security situation and the dramatic social and environmental changes begs a number of questions relating society-nature dynamics during armed conflict. Further, while the conflict in Afghanistan was ostensibly prompted by geopolitical triggers and transnational terrorism, 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 primarily an outcome of it. It also raises important questions about the long-term social and environmental legacies and the prospects for post-conflict futures.

We situate our analysis specifically within a region critically-affected by the current conflict, the area surrounding Tora Bora in the Chaprahar Watershed located in Afghanistan's Nangarhar Province—a portion of the Spin Ghar Mountains that lies along the western end of the Himalaya Forest Complex—a region that plays a central role both in the provision of important environmental values (Delattre and Rahmani 2008) as well as a key strategic role in conflict dynamics along the Afghan-Pakistani border. Our analysis focuses on four key social-ecological elements: (1) local transitional modes of governance and resource management, (2) upper-montane forest complexes, (3) upper- and mid-elevation communal rangelands and (4) mid- and lower-elevation agricultural ecosystems. Each of these social-ecological variables is interwoven with the conflict complex of Afghanistan's eastern region, intersecting problematically with geopolitical processes and political-discursive narratives of security and state formation. We will first scan across recent periods of conflict—reaching back somewhat to conflicts antecedent to 2001. Subsequently, we will tentatively trace out several local causal pathways of change and situate these within regional and historical processes, focusing on the politicization of social-ecological processes relating to forest management and timber trade, rangeland use and governance, and the opium trade.

## **2. Conflict, Insurgency and State Formation 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 80s<sup>3</sup>. In a bid to advance geopolitical interests in Central Asia, the Soviet Union invaded Afghanistan in order to prop up a pro-Soviet government 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 (Kakar 1995). 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

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<sup>3</sup> The geopolitical struggles between the Russia and Great Britain during the so-called “Great Game” of the 19<sup>th</sup> Century that also focused on these same areas and the Khyber Pass to the east are also relevant here.

forces were, however, 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 (who would later found Al Qaeda) and Abu Musab al-Zarqawi (whose efforts would inspire the rise of the Islamic State, or ISIS). In this conflict, the 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 U. S. Central Intelligence Agency and Pakistan's Inter-services Intelligence (ISI) 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 (Dupree 1988; Jackson 2014). Due in large part to these alliances and the success of the Mujahideen resistance, the Soviet Army was ultimately unable to subdue the tribal areas and withdrew from Afghanistan in 1989, arguably triggering the cataclysmic disintegration of the Soviet Union the following year (Dibb 2010). The decade of conflict had 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, the entrenchment of militarized Mujahideen commanders along the porous boundary between Afghanistan and Pakistan left a complex array of non-state powers which became increasingly rivalrous over the years that followed as various leaders contended with one another and with antecedent institutions of tribal power to retain control over the peripheries of the fragile nation state, their resources, and the trade networks that enriched them. These internal rivalries came to a head in 1992, erupting into armed conflict and paving the way for the emergence of the Taliban, largely comprised of students militarized in the Islamic schools of Pakistan, in 1994 (Rashid 2002), which established power in Kabul. In the years that followed powerful Mujahideen commanders remained, in some sense, in the background only to re-emerge as key actors during the US and Coalition invasion less than 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 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 the following year (Kerry 2010, p. 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 the insurgency—had become a vexing problem for ongoing project of state formation.

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 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's ‘Quetta Shura’ until his

death in 2013. While all known insurgency groups operating in the area maintain strong transboundary ties with Pakistan, these groups vary from those that are more local in origin to those which are considered by local residents to be ‘Pakistani Taliban’, such as armed insurgents under the leadership of Mangal Bagh, which are known to operate in nearby Achin (Mansfield 2014a).

Efforts to harden the porous international border and 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 also accountable to Kabul. Pursuant to this, President Karzai appointed Gul Agha Sherzai as Governor of Nangarhar in 2005. Formerly, 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, though temporary, political objects of state-rule: extending the reach of the state into the remote areas of the province, pushing back antigovernment elements, suppressing illicit opium production and trade and tackling 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, diversion of development aid and other resources toward personal 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, Sherzai’s power began to wane as the insurgency gained strength and geographic reach with an increasingly broad base of local support. By 2014, amid growing opposition from both the insurgency and also former Mujahideen commanders in Jalalabad, Sherzai resigned as Governor. In 2015 new groups emerged claiming allegiance to the Islamic State. 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 (interviews, 2015 and 2016). In these latter years, three governors have served in quick succession as the security situation in Nangarhar Province (now under the governorship of Mohammed Gulab Mangal) has deteriorated, with the insurgency continually gaining territory throughout the province. The growing presence of ISIS in the province prompted the resumption of U.S. air strikes in 2016 and, in April 2017, the deployment of GBU-43 Massive Ordnance Air Blast (MOAB) in Achin District, the largest non-nuclear weapon ever to have been deployed by the US military.

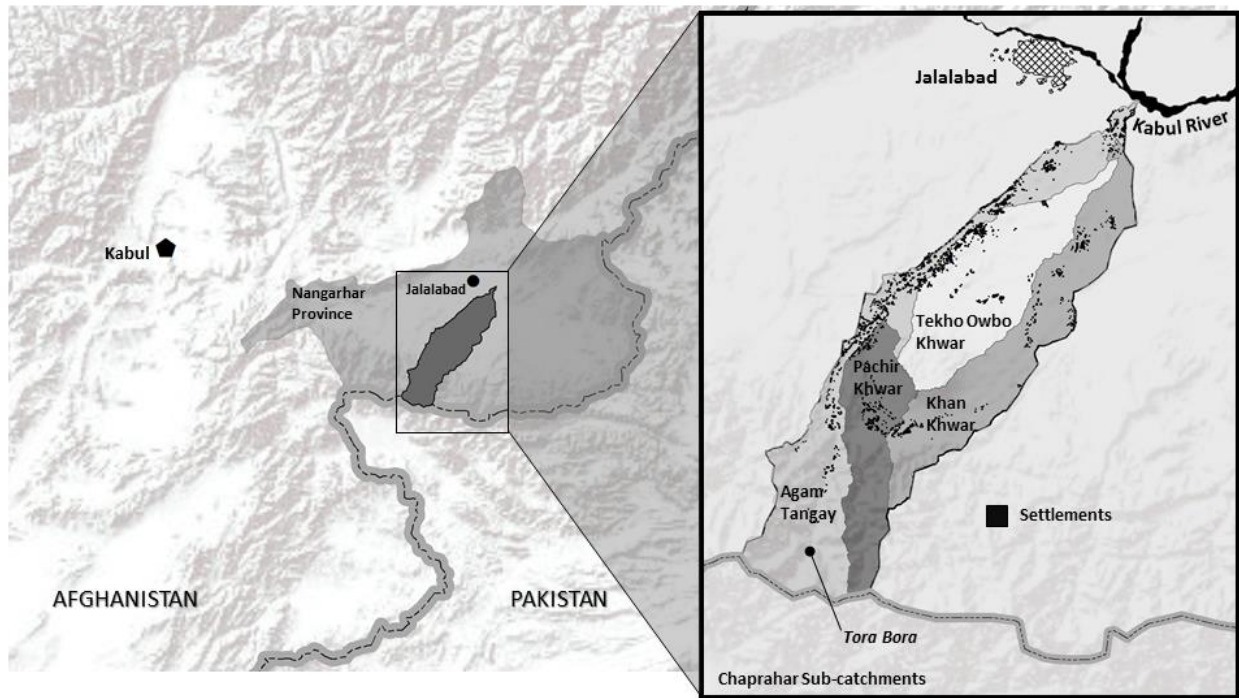
### **3. The Chaprahar Watershed: Context and Research Approach**

Set within this context, we 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 1). More particularly, we will focus attention on its upper reaches of the watershed along the Pakistani border.

Lower elevation forests of the Chaprahar Watershed comprise largely of broadleaf species, such as evergreen oak *Quercus dilatata* and *Q. baloot*, and the economically important walnut *Juglans regia*, while at higher elevations (above 2,000m asl) 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 watershed 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.

Figure 1: Chaprahar Watershed and Sub-Catchments

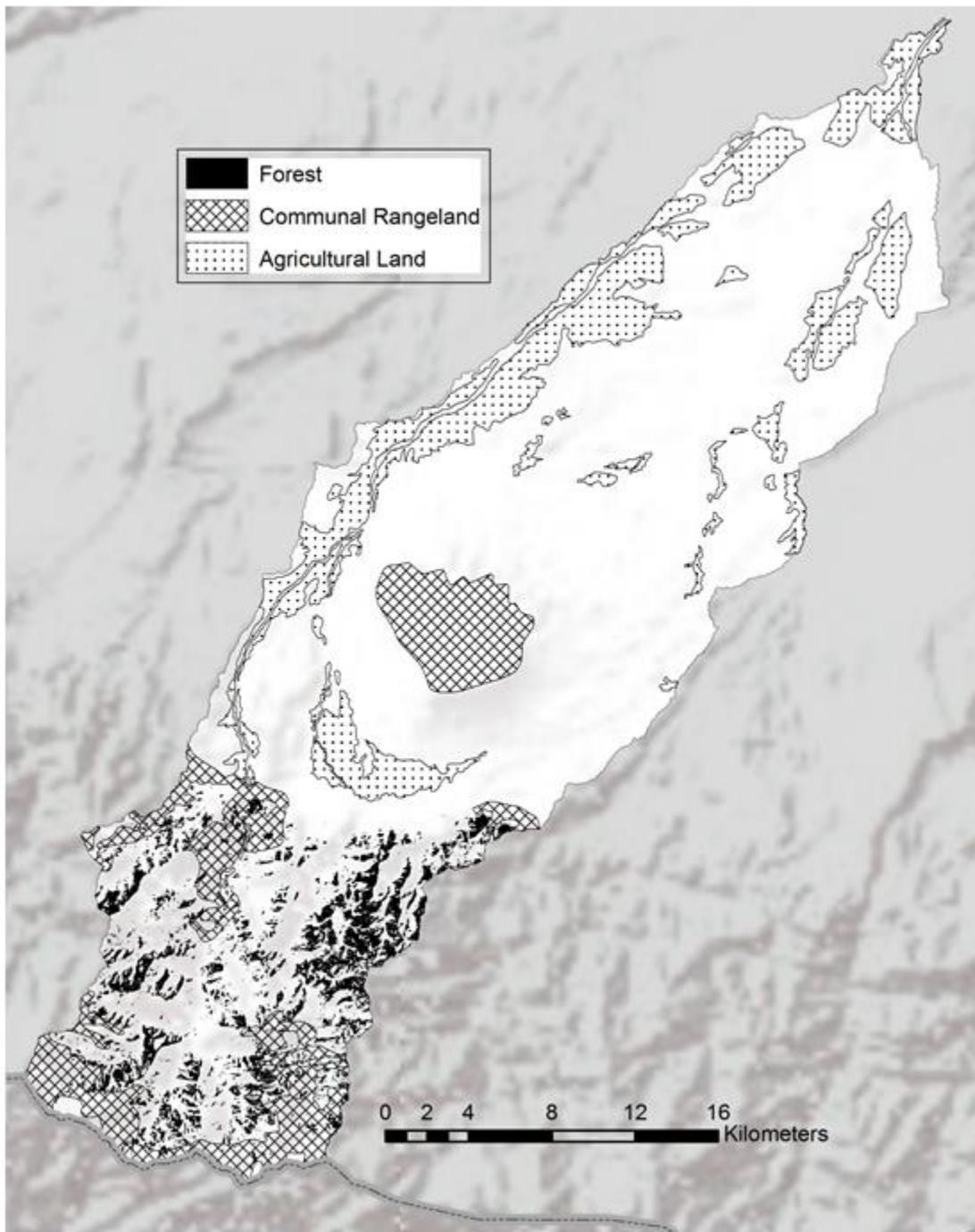


Local communities within the Chaprahar Watershed exhibit a high-degree of resource dependency (MRRD 2012) wherein communal forests, rangelands and agricultural areas play a key role (Ingalls 2011; figure 2). Due to its intense aridity, water is a limiting resource during much of the year and thus seasonal and inter-annual variation in water availability 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 the intermittent abundance, through forest-resource exploitation, the seasonal grazing of ruminants on communal ranges in response to changing rainfall patterns and vegetative growth, and the cultivation of rain-fed crops that vary in spatial extent in accordance with seasonal and inter-annual water availability. Traditional patterns of rangeland and forest use, predominantly rain-fed agriculture and local governance regimes have become intertwined with the prolonged armed conflict (Saidajan 2012).

While Nangarhar Province as a whole has the lowest per capita availability of land in Afghanistan (Roe 2008), the upper reaches of the Chaprahar watershed fares yet worse than many districts closer to Jalalabad, with high poverty rates and persistent food insecurity (Mansfield 2011; Ingalls 2011). While some opportunistic crop cultivation (typically rain-fed 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, 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, the limited amount of irrigated agriculture throughout the watershed is heavily reliant on the capture of snowmelt during the early spring (March-May) and its transportation to lowland agricultural areas through the use of *karez*, subterranean stone channels that have been managed by local communities for, in some cases, centuries.



Figure 2: Selected Land Use and Land Cover in the Chaprahar Watershed



Due to insecurity and risks associated with field work, analyses of change within areas undergoing active armed conflict typically rely on remotely-sensed imagery (Messina and Delamater 2006, Suthaker and Bui 2008, Witmer 2008). While such data provides key insights into various dimensions of change in forest cover, land use and other variables, there are substantial limitations with regard to the inability of remote imagery to elucidate social processes of environmental change, adequate identification of change drivers and causal impact pathways, and other dynamic local processes (Gorsevski et al. 2013). Our research thus combined



remotely-sensed imagery with extensive on-the-ground engagement with local stakeholders within the Chaprahar watershed and Nangarhar Province more generally. In order to understand ecological changes during this period, remotely-sensed GeoEye and Landsat images were obtained and analyzed with regard to topography, and land use and land cover between 2005 and 2009. Satellite imagery for 2004 to 2016 was analyzed to determine rates of poppy cultivation, supplemented by annual field surveys between 2004 and 2016. Forest cover data were obtained for the years covering the most intensive period of transboundary timber trade—1998 to 2009—to characterize 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 watershed (n=53 individuals) were carried out on three separate occasions under the United States Agency for International Development (USAID)-implementing agency Development Alternatives Inc. (DAI), supplemented by interviews and field surveys carried out with local residents and tribal elders throughout Nangarhar Province (n=1,050) since 2010, but drawing on the second author's field work since 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 2016 to identify key changes in the Chaprahar watershed 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.

Understanding the causes of social-ecological change in any system is necessarily complex; perhaps particularly so during periods of armed conflict. Our 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 Chaprahar and the resilience of the system to disturbance. In the sections that follow, we will selectively focus, in order, on several key dynamics and causal processes relating to (1) transitional modes of resource governance relating to armed militia groups and state intervention, (2) forest changes related to illegal logging and trade networks, (3) the erosion of communal rangelands through encroachment, land grabbing and changing pastoral responses to conflict, and (4) significant land use changes in the agricultural sector toward the cultivation of opium poppy. We will subsequently reflect on the ways in which social and ecological domains have become politicized within politico-military power constructs and the relevance of these to our understanding of social-ecological resilience under conflict.

#### **4. Changing Governance Regimes: Intersection of State and Non-State Power**

Governance regimes play a key role in structuring social-ecological systems and determining the resilience of these systems in the face of disturbance and change (Carpenter et al. 2001). Governance arrangements that are responsive to diverse stakeholders, able to balance competing interests and needs, and allow for adaptive decision-making in response to local social and environmental signals of change, are generally linked to positive social-ecological outcomes and tend to foster resilience (Gunderson 2001, Berrang-Ford et al. 2014). More particularly, arrangements that devolve decision-making to local levels generally enhance adaptive capacity (Adger et al. 2006, Nelson et al. 2007, Yarrow and Marin 2007) by fostering self-organization—wherein local communities respond to social-ecological changes by internal restructuring and adaptation (Cumming 2011, Ingalls and Dwyer 2016). Historically, local resource governance has been managed through a complex system of tribal norms and customs, trade and social networks across ethnic Pashtun areas that extend from Jalalabad well into Pakistan. In the relative absence of state institutions the tribal council, or

Shura, has played a central role in social and environmental governance and the management of natural resource, adjudicating disputes and managing relations with neighboring tribes and government authorities. These local governance arrangements overlap and interact with exogenous forces and political influences, including multi-faceted insurgent forces opposed to state rule and broader geopolitical dynamics involving (not only) Pakistan, Kabul, and western Coalition forces. Possibly because of the historically-limited reach of state government within these peripheral areas and complex transboundary tribal loyalties, there is a marked resistance to outside control and 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 the Agam Tangay sub-catchment. 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).

This political ambivalence—and especially (as we have noted above) the resistance it created to the production of an obedient rural periphery and the curtailment of the transboundary movement of militants, arms and resources—was perceived by state-makers to relate at least in part to traditional (non-state) governance arrangements under the tribal Shura (Lee 2007). Thus, despite the historic role played by the Shura, the international aid agencies supported a number of interventions to replace these traditional institutions and to foster state-centric modes of governance. Institutionally, efforts focused on the establishment of new local-level Community Development Councils (CDCs) under the National Solidarity Program in 2005, provided with development aid and legal mandate to direct resource governance and other investments. Similarly, land reform focusing on replacing traditional social mechanisms of land tenure—that depended on collective social memory and were administered through the Shura—were created through a centralized land titling system under the mandate of the Afghanistan Land Authority in an effort to regularize tribal governance systems and render them legible to the central state (Groninger et al. 2013).

Traditional modes of governance had already become increasingly contested by a range of competing forces and social actors prior to the US invasion in 2001. The power of local tribal governance under the Shura had been in decline since the emergence of Mujahideen commanders during the Soviet conflict of the 1980s. 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 military prowess and funding provided to them through the United States (Cramer and Goodhand 2002).

Amid this shifting politico-military terrain and prolonged violent conflict, local residents report substantial increases rates and degree of poverty, worsening food security, and numerous obstacles to accessing healthcare and educational services. Systemic corruption within public institutions, where such institutions exist all, significantly reduced any potential benefits that local communities might receive from the substantial aid funding that has been poured into Nangarhar Province in recent years (Jackson 2014). In response to the destabilization of local power dynamics and deepening poverty the insurgency in recent years has become increasingly local with growing support from local communities seeking to secure resource claims and livelihoods. One tribal elder explained: "Poverty is the main reason for young men joining the insurgency, there are no alternatives, their families need to eat" (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 (interviews 2014).

Not only have local people sought to adapt themselves to these overlapping power dynamics, traditional leadership under the Shura has similarly negotiated these new terrains through tenuous alliance with diverse and competing forces. This has never been unproblematic. Fragmentary and divisive relations not only between 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 our research process have, according to one local respondent, “been killed or have fled” (interviews, 2015) in response to insecurity as well as in-fighting among local leaders and powerful individuals. This has perhaps become more problematic since 2015, as new groups (and reformulations of old groups) have identified themselves as Islamic State. According to local informants, tribal elders allying themselves with Taliban elements have been the targets of assassinations by Islamic State militants (interviews, 2015, 2016).

The destabilization of local governance institutions and conflict between state and non-state power actors figure prominently in the production of social-ecological outcomes in the Chaprahar watershed, exemplified perhaps most acutely by substantial changes in key resource bases including forested systems, communal range lands, and agricultural areas, to which we now turn.

## 5. Forest Change and the Transboundary Timber Trade

In the more mountainous, southern sub-catchments of Agam Tangay and Pachir Khwar, 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 *Pinus gerardiana* and wild mushrooms that are collected and sold 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).

In recent years, the depletion of these resources has occurred at an alarming rate. Remote imagery indicates that less than 28 km<sup>2</sup> of forest remained, a 22% decrease in forested area throughout the district between 1998 and 2009, a particularly intensive period of extraction (figure 3). This is generally consistent with broader trajectories of deforestation in Afghanistan’s eastern region where an estimated 51% of the region’s forest was lost between 1977 and 2002 (UNEP 2003).

The erosion of shallow soils from previously forested areas has resulted in both an overall decrease in water availability during dry months and an increase in the incidence of flooding events in the spring. The hydrographic profile of the watershed, according to local residents, has become increasingly volatile in recent years, concurrent with the rapid acceleration in upstream deforestation. Increased sedimentation has created a broader, shallower stream profile, altering the main channel and exacerbating flooding. While base-flows during late summer are less than 0.3m<sup>3</sup> 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<sup>3</sup> per second, causing considerable damage to crops, local infrastructure, and some loss of life).

While communities have traditionally relied upon forest resources in the upper reaches of Chaprahar, local residents reported that large-scale timber extraction did not begin in earnest until after the end of the Soviet conflict. As U.S. funding streams dried up following the withdrawal of Soviet troops, Mujahideen commanders increasingly turned to the trading of timber to finance their militias as rivalries between various commanders became increasingly volatile. Logging of high-value Deodar cedar and other species became such that, by the mid-1990s the erosion of forest resources in the eastern region was considered by some to constitute the most important environmental after-effect of the Soviet-Afghanistan conflict (Formoli 1995). In the years leading up to the U.S. invasion in 2001, logging 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).

Figure 3: Forest Cover and Change 1998-2009



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 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).

Inter-tribal relations have played an important, but complicated, role in forest governance and the timber trade. According to local informants, the Shinwari of nearby Deh Bala District and the Khogyani of Chaprahar 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 Chaprahar'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 still 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, some villages in the middle reaches of the watershed have appointed rangers (paid with wheat by local families) to patrol communal forest areas and protect them from encroachment. This has not always been sufficient. In one community, 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" (interview, 2011). 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, the US government's NRCC began operations in 2010. Through the NRCC, Coalition forces and the Afghan military attempted to interrupt the trade, but 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). The inability of the NRCC to halt timber trafficking or effectively reduce deforestation—in large measure due to a lack of political will and local support—led to the suspension of anti-timber smuggling operations in 2014.

## **6. Rangeland Degradation and Change**

Due to the mountainous, arid topography of the Chaprahar watershed, the herding of small ruminants, especially local breeds of fat-tailed sheep and goats, on approximately 9,700 hectares of 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. Ruminants are commonly pastured in the community-held ranges of Agam Tangay and Pachir Khwar sub-catchments in 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 typically 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.

While agroecological conditions are typically arid, local communities report that drought conditions were more severe during the period from 1996 to 2004, with a persistent trend toward desertification and loss of range productivity. Armed conflict and insecurity, particularly within the higher-elevation ranges of Agam Tangay and Pachir Khwar, 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 in recent years due to a lack of security, concentrating herds onto the middle and lower elevation ranges in the Tekho Owbo Khwar sub-catchment and around the lower-elevation settlements, 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 remaining ranges have become increasingly degraded, but also contested. Communities report that traditional communal ranges—always a contested resource since Mujahideen commanders had begun to seize lands following 1989—are increasingly being encroached upon by powerful individuals and are converted to settlements or other uses (including settlements and agricultural land for poppy). Inability to access ranges due to insecurity and the enclosure of remaining communal ranges limits traditional mechanisms of spatial and temporal patterns of distribution across the landscape that fostered resilience to localized pressures, including drought, while the destabilization of the Shura has removed traditional de-stocking mechanisms. Concentration of remaining herds within limited secure areas has exacerbated land resource degradation and undermined livelihoods.

## **7. Agricultural Change and the Rise of Poppy**

The rain-fed and irrigated cultivation of traditional crops of potatoes, onions and other vegetables has declined in recent years due to a number of inter-related factors. Deforestation and rangeland degradation in the upper catchment areas has resulted in increased sedimentation of stream channels. 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. The repair of these and of traditional karez (many of which were intentionally destroyed during the Soviet invasion (Lee 2006)) has suffered due to a lack of labor availability, as many young men have left due to the conflict, or to join the ANSF or the insurgency. Villagers report a general breakdown in labor-sharing arrangements that have historically fostered interdependence during time of scarcity (interviews, 2011). Instability and risks associated with accessing market areas and travel along roads have further limited opportunities for agricultural trade, exacerbating long-term conditions of food insecurity and poorly implemented (or non-existent) social protection mechanisms promised by political leaders and Coalition development units.

A traditional response to these sorts of insecurities has been the cultivation 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. Commanding higher prices than any other alternative, poppy is also the only product for which traders will travel to the farm gate to purchase, reducing the farmers' risks of transporting goods during armed conflict (interviews 2014).

The cultivation and trade of opium is not only a key adaptive strategy of local farmers, it is also inextricably linked to conflict dynamics as a primary source of financing for the insurgency. 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—since at least the 1907s (Eliot 1977)—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,' widely-promoting it 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 the mid- and upper reaches of the watershed 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 (interviews, 2010-2015).

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 a more militarized approach (Catarious and Russell 2012). 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 questionable 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 and the success of Coalition interventions in Afghanistan. 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 the Chaprahar watershed 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 geopolitical levels. 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 (Pain 2012). These two goals, however, may apparently run at cross-purposes. A classified communication from then Ambassador Gregory Schulte in Vienna in September of 2008 described 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 not<sup>4</sup>), but were not specific regarding what sort of action would be taken (Schulte 2008, p. 1).

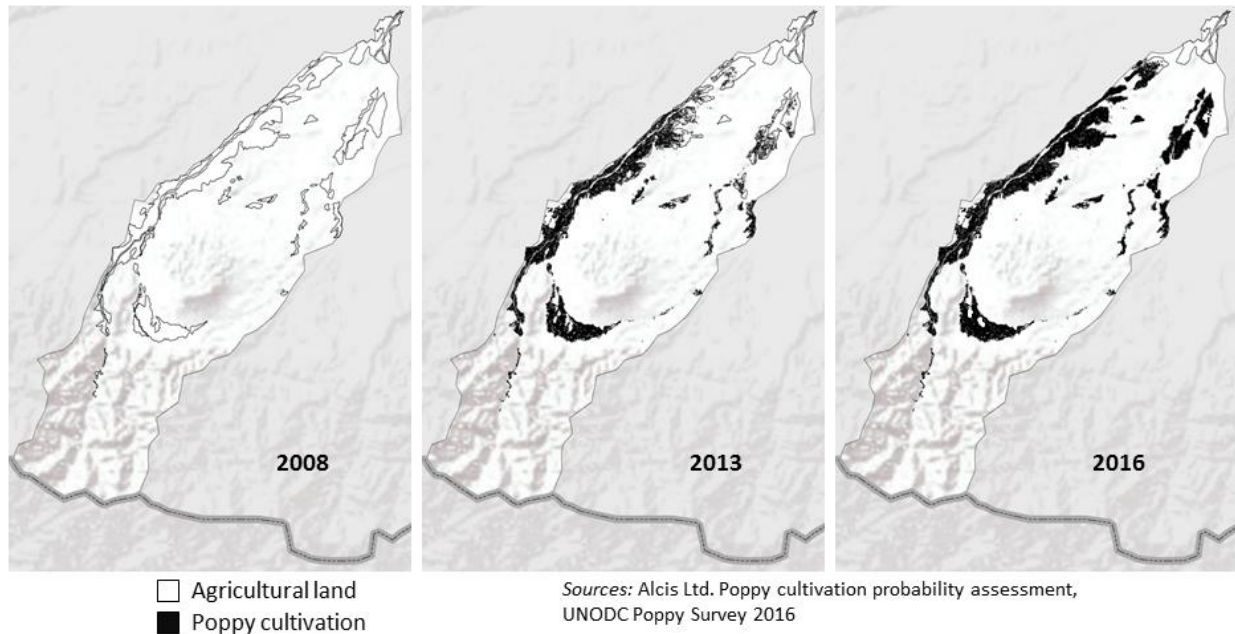
**Figure 4: Agricultural Land and Poppy Cultivation 2008-2016**

Opposition to eradication efforts amongst local communities has grown considerably over the past several years. While virtually no poppy was cultivated in 2008, local residents in Pachir Wa Agam barricaded the road and held off ANSF eradication teams inspecting the district. Resistance to eradication efforts became increasingly violent in the following years. 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 insurgency had a stronger foothold, including the upper-elevation areas of the Chaprahar Watershed (Mansfield 2014b). As the insurgency has gained power in the catchment and the surrounding territories, opium production has boomed with a near-total conversion of agricultural production to opium by 2013 (figure 4). The most significant increase occurred between 2012-2013 growing seasons, where total cropped land in Nangarhar Province—but primarily in Pachir wa Agam, Chaprahar and Achin Districts—increased four-fold from 3,151 ha (in 2012) to 15,719 ha (in 2013), levels that had not been seen since 2003 (Mansfield 2014a). In the Chaprahar Watershed as a whole, 87% of total agricultural land is now devoted to poppy cultivation with even higher concentrations (96-99% of agricultural area) near the Pakistani border. The positive livelihood impacts of this transition to poppy have been substantial. 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 (Interviews, 2013-14).

As a key land use and economic resource, opium poppy emerges as a highly-politicized social-ecological object. Along the ecological domain, it dominates the agricultural landscape as a primary land use, commonly monocropped across large areas producing particular sets of agroecological outcomes relating to a substantial loss of agricultural diversity and, as a short-rotation annual, potentially increased erosion of agricultural lands and sedimentation of stream channels. 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.

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<sup>4</sup> The rumor itself has been often cited but its basis is hard to substantiate, but is reminiscent of the Taliban’s largely-successful opium ban prior to 2001.



## 8. Further reflections on conflict and social-ecological change: *Positive feedbacks, interscalar relations, space and agency*

The foregoing analysis of the specific causal pathways through which armed conflict in the Chaprahar watershed highlights the multidimensional role of power—that of the politico-military apparatus of the state, armed insurgent groups and local communities—in shaping social-ecological outcomes. These observations prompt some reflection on how changing social-ecological elements intersect with geopolitical processes in conflict environments. We organize these final reflections thematically, relating to: (1) the emergence of positive-feedback relationships between social-ecological system decline and armed conflict, (2) the (inter-)scalar nature of power relations under armed conflict, (3) spatial relations between state and non-state militaries and local communities in areas peripheral to the nation state and (4) the problematic role of local agency in the marginal spaces, related to violence and narcotics production and trade.

In the Chaprahar watershed, environmental change and decline emerges as both a cause and consequence of armed conflict. While conflict within the watershed emerged within the broader conflict nexus in Afghanistan and the region, the specific nature and objects of conflict at the local level have been shaped by contestation over scarce resources—especially timber, opium and range lands, as well the control of territory more generally. For example, strategic acquisition of forest and resources to finance the insurgency during the years immediately following the 2001 invasion had significant negative impacts on both the forest itself as well as water quality and flow patterns, leading to conflicts between insurgents, local communities and Coalition forces. Particularly in the case of poppy, there is a clear positive-feedback relationship between cultivation and the expansion of the insurgency in recent years. As the insurgency has gained greater spatial control over the watershed, farmers have increasingly converted their land into poppy cultivation, the production and trade of which has strengthened insurgency efforts both through direct financing of militias as well as in facilitating their support among local communities who have also substantially benefitted from the opium trade. Increased financial resources and local legitimacy has in turn aided the expansion of the insurgency's territorial control and thus poppy cultivation area. The magnitude and rapidity of this positive relationship appears to have driven the social-ecological system in Chaprahar toward (or perhaps beyond) a critical system threshold.

Social-ecological systems are shaped by conditions and processes at lower and higher scalar levels and thus understanding the resilience any system thus entails an interrogation of multiscale processes and impinge

upon system functioning (Folke et al. 2002, Furgeson and Derman 2005). Dynamic processes of conflict and change in the Chaprahar watershed 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. Global trade flows of timber and opium, geopolitical relations not only between Afghanistan, Pakistani and India but also the United States play a formative role in shaping local outcomes. These interscalar relations are, of course, bidirectional; 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, while more contemporary struggles have given rise to two politico-religious groups of global significance, Al Qaeda and the Islamic State.

These interactive relations play out not only across scales, but also across space. “Space” noted 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). The ways in which the spatial arrangement of elements and processes in social-ecological systems shape resilience is an area attracting increasing attention in recent years (see for example Cumming 2011, Allen et al. 2016). The spatialization of conflict and geopolitical contestation, and the ways in which these produce and distribute particular social-ecological impacts across space, is an urgent and largely unexplored area of resilience-related research (Ingalls *forthcoming*). The spatialized outcomes of conflict are relevant not only during conflict. Post-conflict legacies may produce particular path-dependencies that shape system resilience far into the future, constraining options for post-war recovery.

A number of interventions have been foisted upon the Chaprahar watershed and surrounding areas on the margins to the emerging Afghan state in an effort to solidify state control, foster obedience of the periphery to the center, and to allow aid programs and government forces greater access to remote communities. The establishment of CDCs to functionally replace the tribal Shura, legal reworking of land tenure regimes, 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, international organizations and state 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 de facto decentralization that has allowed for the persistence of traditional modes of governance and local self-organization, fostering 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). These complexities 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) our 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. State-based interventions to undermine these local social processes in an effort to extend centralized government control appear to run at cross-purpose with broader goals of resilience.

Resilience scholarship has thought of system margins 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 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 and its relationship to the insurgency. 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. Local agency, closely related to the ability of systems to self-organize, is generally considered to be foundational to local resilience (Carpenter and Brock 2004, Coulthard 2012, Westley et al. 2013) even nearly synonymous with it (Pain and Levine 2012). The success of poppy farming and an increasingly localized insurgency against the state and Coalition forces points to strong local agency, even as it renders this agency problematic by dint of its association with subaltern violence and the global narcotics trade. Our 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.

## **9. Conclusion**

At a very basic level, our analysis suggests that social and environmental dynamics under conflict are iterative and closely related; the sociopolitical conflict complex is 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 and ecological outcomes. In this case, contestation surrounding territorially-embedded resources—especially timber and opium poppy—become politicised and thus constitute not only social-ecological concerns but also objects of state rule.

The activation of local social agency in this context intersects problematically with these contestations, highlighting the perspectival nature of what constitutes a desirable social-ecological system state in the context of antagonism between state and non-state actors. Addressing social-ecological change 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. We 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 function not only as areas of heightened tension and vulnerability, but also as sites of innovation and adaptation. More work remains to be done in elaborating social-ecological processes

within other sorts of conflicts or in different geographic settings. Further, while armed conflict environments may in some sense constitute extreme cases, the dynamics explored here may also point to similar processes in other, less violent contexts, relating to (for example) contestations of power over social-ecological objects between state and non-state actors, or how particular narratives of (in)security are invoked in these contestations.

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